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Katherine L. Bullard
University of San Francisco, klbullard@dons.usfca.edu

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Katherine Bullard, DNP(c), RN, MS, NEA-BC

University of San Francisco

Marjorie Barter, RN, EdD, CNL, CENP

Elena Capella, EdD, MSN/MPA, RN

Ann Dechairo-Marino, PhD, RN, NEA-BC

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Section I: Abstract

A regional health system's decision to rapidly implement a new electronic health record (EHR) in order to meet Stage 2 meaningful use requirements led to a need for innovative cost-containment strategies. Tapping the local pool of unemployed newly graduated nurses as half the required super user workforce leveraged the technology skills of novice nurses registered nurses as trainers of experienced nurses in five hospitals. The novel workforce migrated from hospital to hospital, thereby reducing the number of experienced nurses reassigned to super user duties in each hospital. This strategy also reduced the amount of contract labor required to backfill nurse super users' clinical shifts. The innovative model reduced labor costs associated with super user staffing by 31.8%, while positioning the organization for successful attestation to Stage 2 meaningful use objectives. Employment of the recently graduated nurses as RN Residents upon completion of the EHR implementation enabled the organization to augment its clinical workforce with expert users of its EHR, and to rapidly achieve Stage 2 meaningful use compliance.

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Section II: Introduction

Background

The American Recovery and Reinvestment Act of 2009 (ARRA) is the foundation of a complex body of regulations intended to promote development of a national healthcare infrastructure. A key subset of those regulations is contained in the Health Information Technology for Economic and Clinical Health Act (HITECH Act), which was signed into law on February 17, 2009 (U.S. Department of Health & Human Services [HHS], n.d.). In addition to strengthening enforcement of privacy and security provisions of the Health Insurance Portability and Accountability Act of 1996, the HITECH Act provides for incentives to providers and hospitals for the adoption of EHR technology that has been certified to meet a set of minimum requirements. Eligibility for incentives requires more than simply installing certified technology; rather, an organization must demonstrate the EHR is being utilized in a meaningful manner to improve the quality of care being delivered (Centers for Disease Control and Prevention [CDC], 2012). Achievement of the level of EHR utilization that constitutes meaningful use requires not only successful implementation of the technology and devices; it requires adoption of the technology by end users. Selection and implementation of an EHR are not a guarantee of success. Achievement of the desired effects of EHR implementation is only achieved if and when clinician end users fully adopt the technology and its functionality (Granlien & Hertzum, 2012b).

Eligibility for meaningful use incentives for hospitals requires such facilities to attest to their compliance with objectives established by CMS as indicators of extensive use of EHR technology to promote optimum patient safety and clinical outcomes. CMS refers to its performance targets as Clinical Quality Measures (CQMs), which must be achieved

progressively in 3 stages (Centers for Medicare & Medicaid Services [CMS], 2014). Hospitals must complete each stage sequentially and within a prescribed timeframe in order to quality for full incentives. An organization's failure to achieve meaningful use compliance within the established timeframes will disqualify hospitals from eligibility for maximum incentives and eventually result in reduced Medicare payments. The attestation for each stage of meaningful use requires at least 90 consecutive days of data collection as evidence that thresholds for each objective have been achieved or exceeded. The deadline for hospitals to complete the attestation period for Stage 2 is driven by when they achieved Stage 1; hospitals that attested for Stage 1 in 2011 must demonstrate the more challenging Stage 2 compliance by October 1, 2014.

Providence Health and Services Southern California (PHSCA) is an integrated healthcare delivery system in California that operates six hospitals, multiple ambulatory clinics, a skilled nursing facility, and an array of sub-acute, transitional care, rehabilitation, and home health and hospice programs. (At the time this project was initiated, PHSCA operated only five hospitals.) PHSCA comprises one region of a larger healthcare enterprise that provides services across the entire continuum of acute, ambulatory, home-based and residential care settings in five states in the western United States (U.S.). In 2010 enterprise leaders decided to adopt a single EHR platform for the entire organization, and selected Epic as the vendor. That decision came less than a year after PHSCA had decided to invest in upgrading its existing EHR to a newer version of the same product. After extensive review of the financial and operational implications of operating disparate platforms, regional and system executives agreed that the California region would stay the course for at least five years before migration from the current technology to Epic.

Implementation of an EHR enables hospitals and health systems to record, store and access patient information electronically to promote care coordination, quality, patient safety and efficiency (Duckert & Rose, 2013; Kutney-lee & Kelly, 2011; Silow-Carroll, Edwards, & Rodin, 2012). A recent study of 708 acute-care hospitals in the United States compared outcomes for two years before and two years after the year of EHR adoption, and reported small improvements in length of stay and 30-day mortality rates after adoption (Lee, Yang, & Goodwin, 2013). The researchers attributed these improvements to communication, care coordination, and increased speed in ordering of tests and treatments.

Although implementation of an EHR may improve quality, patient safety and efficiency, those improvements may be limited based on the overall functionality of specific applications (Morrissey, 2012). PHSCA's upgrade of its existing EHR product exemplified such limitations. The upgrade to a newer version of the software was undertaken as a regional initiative, and called for development of a single version of the software, referred to as a *single instance,* for adoption by all member hospitals in the region. The complexity of building a single instance of the product while accommodating local differences (e.g. medical staff rosters, charge structures, treatment protocols and order sets) exceeded the capacity of the product's architecture and functionality. The results were awkward workflows, documentation workarounds, and frequent unscheduled downtimes, all of which would pose a threat to medical record integrity and eligibility for federal meaningful use incentives (Desroches & Rosenbaum, 2010). In late 2012, PHSCA executives assessed the risks and benefits of abandoning the current platform and accelerating the timeline for adoption of Epic. After extensive consideration, a recommendation was made to the enterprise executive team to accelerate plans for migration to Epic, and to complete implementation in all PHSCA hospitals by June 2014. The recommendation was

approved by the system Board of Directors in January 2013, and the project was immediately launched, albeit with a significantly compressed timeline for project planning and budget development. Utilization of the standard PHS project plan would have allowed at least two years of preparation before implementation; the accelerated plan was adopted in hopes of achieving full compliance with Stage 2 meaningful use eligibility criteria before the federal deadline, thereby qualifying PHSCA to receive the maximum financial incentives offered by the U.S. government.

Local Problem

The urgent conversion from the existing EHR to Epic in an effort to achieve the maximum benefit of meaningful use incentives precluded opportunities for gradual accrual of capital to fund the project. The compressed timeline for implementation of Epic posed significant financial challenges to PHSCA, which lacked adequate preparation time for normal financial planning in anticipation of such a major initiative. This, in turn, led the PHSCA executive team to aggressively pursue expense mitigation strategies across all aspects of the proposed project. Although the majority of project costs would be capitalized and allocated to the enterprise budget for Epic implementation, operational expenses related to staffing backfill for end-user training and support were not included in the already-developed operations budgets for 2013 and 2014. The EHR vendor's required training time for clinical end users ranged from 24 to 80 hours for registered nurses, with the highest training hours required for nurses in specialty settings such as neonatal intensive care, labor and delivery, and perioperative services.

The Regional Chief Medical Officer (RCMO) and Regional Chief Nursing Officer (RCNO) for PHSCA were designated as clinical executive sponsors for the Epic project. Coordination of clinician training and support responsibilities were borne by the Regional Chief

Medical Information Officer (RCMIO) and Regional Chief Nursing Informatics Officer (RCNIO), who reported directly to their counterparts at the system level and indirectly, via a matrix relationship, to the RCMO and RCNO. The latter executives were directed by the Regional Chief Executive (RCE) to pursue strategies for Epic training and implementation that would be more cost-effective than the standard approach utilized by all other regions of PHS.

The challenge at this juncture was to ensure successful implementation and full adoption of Epic by clinical end-users in order to qualify for the maximum financial incentives for meaningful use, in spite of the considerable up-front costs associated with implementation. The old adage of avoiding being penny wise and pound foolish came to mind for some members of the executive leadership team, as they weighed the appeal of meaningful use incentives against the onerous costs of Epic implementation. Although all other regions of the PHS enterprise had utilized the standard project model recommended by Epic, it was clear that PHSCA would have to somehow whittle down standard project costs without compromising outcomes, in order to preserve its ability to meet other financial obligations. In response to this challenge, the RCNO explored key drivers of successful EHR implementation and adoption, with the intent of leveraging the region's constrained resources to optimize those drivers while curtailing overall project costs.

Intended Improvement

The aim of this project was a structured, cost-effective nursing workforce plan to support successful implementation of the Epic platform across five acute-care hospitals in PHSCA. Financial modeling of the organization's standard approach to development and deployment of a nursing super user workforce to support implementation revealed a projected labor expense of $14.2 million for the five hospitals. This included anticipated costs for super user hours, benefits

(calculated at 30%) and contracted supplemental labor to backfill super users' vacated clinical shifts. The detailed financial analysis is found in Appendix A.

The proposed plan incorporated clinically inexperienced, recently licensed registered nurses as EHR super users to support nursing and allied health end users of the technology. The measure of cost-effectiveness would be actual labor expense for nursing super users and supplemental staffing utilized to backfill clinical shifts vacated by staff nurses temporarily reassigned to the super user role. Cost-effectiveness would be demonstrated by a savings of at least 15% of calculated expenses for the EHR vendor's standard recommended super user model.

A secondary project objective was to retain a sufficient number of new graduate super users after Epic implementation to fill all available RN Residency positions in summer and fall of 2014. Employing the new graduates as clinical staff would enable the organization to retain their expertise as end-users, and to reduce RN residency training hours by 24-40 hours per nurse, depending on the clinical settings into which the RN residents would be hired.

Review of the Evidence

Literature review.

A review of the health care, technology and business literature was conducted by using Fusion to identify studies published between the year 2001 and the present, and related to implementation of new technology. Search terms included technology implementation, technology adoption, EHR, EMR, clinical information systems (CIS), and super user. The search resulted in more than 100 articles, which were reviewed for relevance, which was determined by content related to factors or conditions related to implementation outcomes. A second search was conducted for studies during the same time period and related to technology or informatics competencies of nurses. The most pertinent 12 articles were critically evaluated

using the Johns Hopkins Nursing Evidence-based Practice Research Evidence Appraisal Tool (Dearholt & Dang, 2012) (Appendix B). The summary analysis of the studies is depicted in Table 1.

The overall body of literature addressing factors that promote the success of technology implementation and end-user adoption was found to be limited for both general professional businesses and healthcare. Studies examining enablers and barriers for technology implementation ranged from single-hospital case studies to systematic reviews and meta-analyses of the literature (Gagnon et al., 2012; Granlien & Hertzum, 2012b; Mair, May, O'Donnell, Sullivan, & Murray, 2012; Pare, Sicotte, Poba-Nzaou, & Balouzakis, 2011). Barriers and enablers were discussed from both company-level and individual-level perspectives (Oliveira & Martins, 2011). Most studies mentioned two common factors as primary enablers of successful implementation and end-user adoption of clinical information technology: perceived usefulness and ease-of-use. Straub (2009) added the phenomenon of social learning to the process, exploring the extent to which social learning influenced prospective end-users' behaviors related to technology adoption. Granlien & Hertzum (2012b) focused on barriers to adoption of technology by clinical end-users, and reported that obstacles to usefulness or ease of use are the most significant barriers. They observed that clinical end-users of the EHR were likely to form opinions during their early use of a technology, and not change those opinions of the product's utility or ease of use. Perceived utility of both the technology and the organization's implementation readiness were also discussed by Pare et al. (2011); the researchers speculated that clinicians' perceptions of organizational readiness also influenced the success of implementation, and suggested that perceptions of utility and organizational readiness may be related.

The third and fourth most commonly cited factors supporting successful EHR implementations were end-user training and end-users' participation in preparing for the implementation. A meta-analysis by Gagnon et al. (2012) of more than 100 studies concluded these two variables were the most important drivers of successful adoption of clinical information systems, and that unfamiliarity with the technology or insufficient training were primary barriers to success. These findings were consistent with a recent study of EHR implementations in nine hospitals in the United States, in which researchers identified the adequacy of training as a key success factor (Silow-Carroll et al., 2012). Multiple studies reported the adequacy of hands-on support by peer experts was an important driver of end-user acceptance (Gagnon et al., 2012; Granlien & Hertzum, 2012; Whittaker, Aufdenkamp, & Tinley, 2009). Peer experts who serve as facilitators of technology adoption by end-users are commonly referred to as super users (SUs), who provide at-the-elbow support to end-users and promote a "positive culture of change" (Simmons, 2013, p. 54). In addition to facilitating end-user skills development, SUs have been found to impact other employees' attitudes toward the new technology (Halbesleben, Wakefield, Ward, Brokel, & Crandall, 2009).

In recognition of the potential significance of nursing in the implementation of the electronic health record, the literature was reviewed for studies exploring nurses' competency and attitudes toward technology. An early study of U.S. nursing students and faculty concluded that developing information technology knowledge and skills should be an integral goal of nursing curricula (McNeil et al., 2003). A few years later, Fetter (2009) conducted a study of senior nursing students attending a private university to determine their self-reported level of skill related to using healthcare information technology. She reported students recommended increased access to information technology in the curriculum, although the small size of her

study, 42 students, limits the opportunity to draw inferences from it. A more recent descriptive study of self-assessed nursing informatics competencies of 289 nursing students in three undergraduate programs and one terminal degree program concluded that students in all four programs were competent in basic computer skills, attitudes toward informatics, and skill in using wireless devices (Choi & De Martinis, 2013). The authors noted that the graduate students, who were enrolled in a Doctor of Nursing Practice curriculum, reported slightly higher competency levels than did undergraduates. Limitations of this study are found in the sample population being drawn from a single university. Although it is not possible to draw definitive conclusions from this study, the self-reported achievement of competency in all four programs suggests that curricula may be advancing to include more nursing informatics content.

Anecdotal and unpublished evidence.

Although empirical studies addressing the implementation of EHR technology were limited in number, additional evidence was accrued through an informal network of healthcare and leadership colleagues, and internal assessments of Epic implementation success in other regions of PHS. A former Chief Nursing Officer who is now a hospital Chief Executive Officer in northern California reported using two dozen recently graduated registered nurses as super users for implementation of an electronic health record in a Los Angeles area hospital more than 5 years ago, and noted it was a cost-effective approach to meeting training needs (G. Matthews, personal communication, June, 2013). A family member employed as a Physician Assistant in a Bay Area clinic described having very positive experiences during the EHR implementation in his organization, and spoke in glowing terms about the recently graduated nurses who were engaged as super users during that project, commenting “They were very helpful” (R. G. Ochoa, personal communication, February 15, 2013). The former Chief Nursing Officer of that Bay

Area facility reported that utilizing recently graduated nurses as super users for the EHR implementation also positively impacted the attitudes of nurse managers and staff nurses toward hiring new graduates as staff nurses (K. Horton, personal communication, August 23, 2013). The Bay Area program was the doctoral project of a colleague whose work further validated the potential merit of utilizing recently graduated registered nurses as EHR super users before transitioning them into a clinical residency curriculum (Stanley, 2013).

Finally, the Chief Nursing Informatics Officer and Epic Deployment Director for PHS were rich sources of anecdotal observations about drivers of successful implementation of Epic. They reported that the adequacy of training and end-user support by Epic super users was the primary distinguishing characteristic of the most successful regions. Locations in which super user support was less robust were generally less successful in achieving a level of EHR adoption that would support achievement of meaningful use eligibility criteria. They emphatically cautioned the RCNO and RCNIO of PHSCA to ensure adequate investments in training and go-live support by nursing super users.

Theoretical and Conceptual Framework

Theories: Situated social cognition and information systems continuance.

Psychologists Smith and Semin developed situated social cognitive theory as a modification to the general social cognition theory introduced by Albert Bandura in the early 1980's. Social cognition refers to "the way people perceive and evaluate other people and social groups and act toward them" (Smith & Semin, 2007, p. 132). Situated social cognition theory contradicts Bandura's original theory, which presumed that social cognition involved fixed, unchanging perceptions about groups or individuals. Smith and Semin proposed that social cognition is situational and is responsive to the actual circumstances and context in which the

perception is occurring. Those circumstances may reinforce a previously held perception, or may lead to modification of the perception. The authors describe this phenomenon as causal interdependence of the perception (or cognition) with the contemporary environment (Smith & Semin, 2007). Consideration of anecdotal successes of recently graduated nurses supporting EHR implementations within the framework of situated social cognition suggests that perceptions about new graduates might be impacted by observations of them in the super user role.

A second useful theoretical framework, the information systems continuance theory, distinguishes acceptance and continuance behaviors related to technology implementation. An exploration by University of South Florida researcher Bhattacherjee of continuance intention related to use of technology concluded that continuance intent is strongly influenced by users' expectations, based on prior use (Bhattacherjee, 2001). This study of information systems continuance predictors was grounded in Rogers' earlier innovation diffusion theory and general consumer expectation-confirmation theory. Bhattacherjee demonstrated that confirmation [of expectations] was a stronger driver of end-user satisfaction with technology than was perceived utility, and that continuance of technology use dependent on end-user satisfaction. This suggests that early experiences with the Epic technology, during which super user facilitation occurs, would have significant impact on the likelihood of continuance to full adoption of the EHR technology. The full adoption of Epic is an essential precursor to PHSCA's achievement of eligibility for maximum Stage II meaningful use incentives.

Concept: Digital natives and digital immigrants.

At the same time that Bhattacherjee was investigating technology continuance behaviors, Prensky was examining comparative generational characteristics of individuals who were born

into an environment in which digital technology was ubiquitous, and those who were born before the era of digital technology (Prensky, 2001a; Prensky, 2001b). He referred to the former group as digital natives, noting they are characterized by a preference for receiving and processing information rapidly and in an interactive mode, often while multitasking. Digital immigrants, in contrast, have migrated into the digital world from an era in which learning took place with teachers who used lectures, step-by-step sequencing and a generally linear approach. Although neuroplasticity enables digital immigrants to adapt and succeed in the digital world (Prensky, 2001b), the theorist posited that digital immigrants usually retain thinking and information processing styles developed during their formative years, before technology had become ubiquitous. He compared this residual tendency to the accent of one who has learned a second language but does not speak it exactly as a native would.

Blending theories and concept into a useful framework.

The evidence left little doubt that the adequacy of super user resources would be a key driver of successful Epic implementation. Research also indicated that super users influence end-user acceptance of, and competency in using, new technology. Limited research related to nursing informatics competencies was augmented by anecdotal success stories about new graduates serving as super users; this evidence was bolstered by Prensky's concept of digital natives, into which category recently graduated nurses would fall. The theory of situated social cognition would be relevant to the acute care environment into which the recently graduated nurses would be hired as faculty and facilitators of learning for experienced staff. This paradigm shift could influence previously held perceptions (cognition) that new graduates come to the workplace without expertise. Leveraging this opportunity to change perceptions would reframe

the image of recently graduated nurses into one of technical expert and supportive resource rather than needy novice.

Situated social cognition might also be a factor in end-user perceptions of the value of Epic as the new EHR, because of earlier disappointing experiences with the existing platform. Minimizing the impact of those previous experiences on end-user attitudes would require intensive efforts by trainers and super users. From a pragmatic standpoint, engaging a large cohort of recently graduated nurses as Epic super users would be a cost-effective investment in promoting full adoption of the technology by ensuring positive early experiences of end-users to drive continuance, as demonstrated by the information systems continuance theory.

Section III: Methods

Ethical Considerations

Implementation of the new graduate workforce plan was discussed informally with the CNOs of the five hospitals approximately 90 days before development of the formal plan. All five CNOs expressed skepticism about the likelihood of recently graduated nurses having sufficient clinical credibility to assist experienced nurses during EHR implementation. They emphasized that super users should have extensive clinical experience as a backdrop to their technology expertise. After lengthy discussions during their regular CNO Council meeting, they unanimously vetoed consideration of new graduates for super user roles, citing the new nurses' lack of experience with clinical documentation workflows currently in place at PHSCA. In the face of this resistance, the innovative approach was abandoned by the RCNO in deference to the shared decision-making input of the hospital CNOs.

Employment of recently graduated nurses to serve as Epic super users was not considered again until the financial modeling was performed. Simultaneously, PHSCA was experiencing ongoing nursing vacancies not fully mitigated by its supplemental staffing vendor, due to the latter's limited pool of per diem nurses. In May 2013, the RCNIO encouraged the author to revisit the concept of hiring new graduates to fill the gap, noting that the CNOs' previous concerns about unfamiliarity with clinical workflow were irrelevant because "all the workflows are changing with Epic" (E. Petrich-Kennedy, personal communication, May 15, 2013). As a result of this conversation, the RCNO performed a preliminary analysis of the potential cost savings offered by the plan, and met individually with each hospital CNO to review the financial analysis and to enlist support for a more extensive proposal. The individual meetings enabled the RCNO to address the impact of workforce shortages on each hospital, and to explain the

benefits of the proposed alternative strategy. This approach to generating consensus was consistent with two of the organization's core values, respect and stewardship, and demonstrated the Catholic social teaching of subsidiarity, which holds that the persons most directly affected by a decision should participate in decision-making. In this case, the hospital CNOs were accountable for adequate staffing of their hospitals and nursing competency in use of the EHR; this ensured their stake in the project outcomes.

The project proposal was submitted to the University of San Francisco School of Nursing and Health Professions for determination of its non-research characteristics, and was approved as an evidence-based change in practice project on September 15, 2013 (see Appendix C). This event obviated the need for submission to the University Institutional Review Board (IRB). Several months into project implementation, however, the author received notice from the PHSCA leader responsible for oversight of nursing research in the region. She advised that organizational policy required review and exemption of the project by the IRB of one or more of the PHSCA hospitals. The author immediately submitted the project, which was already underway, to the intake coordinator for the IRB for three of the five hospitals, and exemption was granted on May 8, 2014 (see Appendix D).

A final ethical consideration related to the question of whether hiring new graduates as temporary employees would compromise their long-term employment opportunities, or otherwise negatively impact their career progression. After focused discussions with the hospital CNOs and the human resources leader for PHSCA, the author concluded that the prospective temporary employees would benefit from the addition of EHR skills and a work history in the hospital setting, and PHSCA would benefit from the opportunity to observe the new graduates at work before considering them for RN Residency positions. Nursing and HR leaders also

determined there would be no displacement of current employees by the proposed workforce, and there was no anticipated direct impact on patients because the new graduates would not perform any clinical duties. There would be a positive direct impact on patients attributable to the continuity of staffing promoted by the proposal, which limited the number of experienced nurses required to serve as super users.

Setting: Organizational and Market Assessment

A strength, weakness, opportunity, and threat (SWOT) assessment of PHSCA relative to the staffing implications of the EHR implementation was performed in June 2013. The strengths and weaknesses revealed paradoxical nursing workforce conditions, with existing registered nurse (RN) vacancies in the organization in spite of an abundance of unemployed recently graduated nurses in the local market. The full SWOT analysis is found in Appendix E.

A 2012 report on the supply of registered nurses in California identified Los Angeles as one of two counties with the highest number of RNs, with more than 30,000 registered nurses at the time of the study (Office of Statewide Health Planning and Development [OSHPD], 2012, p. 1). A survey of over 2,000 recently graduated RNs who were recently licensed in California between September 2011 and August 2012 revealed that 46% were not employed as nurses; 45% of respondents who were not working had graduated with Bachelor of Science in Nursing degrees (Bailey et al., 2013). The rate of new graduates not employed in nursing was slightly lower in the area immediately surrounding PHSCA than for the state as a whole, although at 42% it exceeded the national average of 36% reported by the researchers (Bailey et al., 2013).

The CNOs of the PHSCA hospitals had previously restricted hiring of inexperienced RNs, citing constrained preceptor resources, limited education resources, and resistance from hospital Chief Executives and Chief Financial Officers, some of whom viewed nursing residency

programs as expensive luxuries. All five CNOs were eager to reduce contract labor utilization, and raised concerns about the potential impact of the Epic project on their ability to adequately staff their nursing units. Of particular concern to the CNOs was the upcoming reassignment of key clinical staff to super user roles, which would pose a threat to staffing effectiveness and care delivery. This constellation of concerns related to staffing predisposed the hospital CNOs to be receptive to creative strategies for Epic backfill staffing. They were further encouraged by anecdotal feedback regarding small-scale successes achieved by other California hospitals as a result of engaging new graduates as super users.

In spite of the identified weaknesses and threats, multiple strengths and opportunities were apparent. Nurse leaders of an adjacent region of PHS, where the Epic implementation had recently been completed, offered internal consulting expertise to support the Nursing Informatics team. That region's Director of Nursing Resources for nine hospitals had recently coordinated utilization of contract nurses for backfill staffing across multiple hospitals over 12 months, and offered best practice information to the PHSCA nursing leadership team. Contract renewal negotiations with the preferred staffing vendor for PHSCA had just been completed, and were leveraged to include favorable rates for EHR backfill staff as an extension of the contracted services.

Results of the SWOT analysis and interviews of CNOs of other hospitals that had used new graduate super users were shared with a select group of content experts in clinical informatics, human resources and system nursing leadership. The group expressed unanimous support for a creative solution involving the use of new graduate RNs to fill a portion of the Epic SU positions, reducing the need for reassignment of core staff to fill that portion of the super user ranks.

Planning the Intervention

Redesigning the super user workforce.

The organization had already scheduled five hospitals and adjacent facilities for EHR activation over a five-month period. Four go-live events were spaced at seven-week intervals, with separate go-live dates for three hospitals, and a fourth event during which two hospitals would simultaneously activate the new EHR. The hospitals did not share staff, due to separate labor union contracts and a regional policy prohibiting concurrent employment by more than one facility in the region. As a result, each site would require a dedicated SU team for approximately eight weeks before and four weeks after the scheduled go-live. In the former period, the SUs would assist with end-user practical training in computer labs and dedicated training spaces in some nursing units. In the two weeks immediately preceding the go-live event, the crescendo of preparations would require all SUs to participate in dress rehearsals, during which the EHR system was tested for several hours to validate its operational readiness for go-live. On the final day of preparations, the SUs would assist in creating new medical records for all patients in the hospital at that time. The climax of transition activity would be the switch from the existing EHR platform to the new product, an event commonly known as the "cutover" to the new EHR.

Cutover would trigger the next phase of super user activity during the Epic implementation. During this phase, the entire SU workforce would be distributed throughout clinical areas according to a schedule that ensured coverage during all operating hours. For most hospital departments, SU support would be required 24 hours per day; in procedural and outpatient areas with specified operating hours, SUs would be present whenever patients were present, and remain on call after hours. The primary role of the SUs during this period would be the provision of at-the-elbow coaching and reassurance to end-users of the new EHR and

associated workflows. SUs would also serve as troubleshooters for the EHR technology, maintaining communication between clinical end-users and the project command center, which would dispatch technical support personnel as needed to address EHR performance concerns. Both SU roles, end user support and troubleshooting, would be in highest demand during the first two weeks after cutover, after which end-user competency and system performance were expected to become more stable. SU staffing would then be gradually reduced during the third and fourth weeks. During the fifth week after cutover all super users would return to their normal clinical duties.

The plan for a modified super user workforce began with confirmation of the number of super users required as a baseline for ongoing support of Epic post-implementation. In ongoing steady state, SUs provide informal support to their peers in the course of their routine clinical practice. This steady state baseline would require only half the number of super users that would be required for the EHR implementation. The CNO Council agreed that experienced nursing staff should be tapped to fill those long-term super user positions, and that recently graduated nurses would be hired as temporary employees to fill the additional super user positions required to support Epic implementation.

The primary resource for this project was a new graduate workforce equal to 50% of the super user staffing levels for each hospital's EHR go-live event. Application of the EHR vendor's formula for calculating the required number of nursing SUs, the Nursing Informatics team concluded that the four larger hospitals would each require 110 to 120 super users, and the smallest hospital approximately 70 nursing SUs. Half the total required super user positions for each hospital would be filled by experienced direct care RNs; the remaining super user positions would be filled by the new graduates. Each super user position was scheduled for a total of 196

hours of training and work time. Contract staff would be utilized to backfill all super user shifts because employed staff willing to work overtime would be needed to accommodate anticipated seasonal surges in patient volumes during the implementation period, which was scheduled during the winter months. Contract labor hours to fill the clinical shifts vacated by the SUs included eight hours of orientation, for a total of 204 contract hours per vacancy (see Table 2).

The first and second hospital sites would require 60 and 55 new graduates, respectively. The third go-live event at two hospitals simultaneously resulted in the need for 35 additional s to achieve the required super user-to-staff ratio. Project leaders and Human Resources staff agreed to hire a few additional new graduates to allow for limited attrition before training began. The only additional resource requirement was the Nurse Manager for the new team. The entire workforce for the project was expected to total 160, including approximately 10 people to offset anticipated attrition.

Project cost.

The budget for Epic implementation by PHSCA included labor hours for backfill of core staff serving as super users, and for replacement of clinical staff while they attended end-user training of all employees. The subset of backfill expense relevant to the project was the cost of backfilling direct care clinical shifts vacated by registered nurses assigned to SU roles at each hospital. With assistance from financial analysts, the project team determined the budgeted salary and benefit expense for these nursing positions, confirming the budget forecast was predicated on the current “fully loaded” rate, the PHS nomenclature for average hourly rate plus benefits and differentials. The team predicted the direct cost of the project by determining total training and work time for each super user, multiplying those projected hours by the fully loaded average hourly rate for RNs by hospital, and adding the expense of contracted backfill based on

vendor rates. The total direct expense projection produced by these calculations was $14.2 million. The incremental expense attributable to contract labor rates for backfill staffing contributed $4.7 million of the total expense, and had not been factored into the organization's operational budget for the implementation period. This worrisome variance was a key driver of efforts to develop a more cost-effective strategy.

The proposed innovative model utilizing recently graduated RNs as SUs offered the advantages of a lower average hourly rate and reduced training time for super users, as the new graduates would be scheduled to migrate from one hospital to another but only complete the training cycle one time. Although the project budget did not include potential long-term expense offsets, the project team anticipated the potential benefit of hiring many of the SUs into future RN residency programs as positions become available. The new hires would require reduced training time as a result of their existing competency in use of the EHR.

Direct costs for the proposed staffing model were calculated on the basis of projected training and work hours for experienced RN SUs, new graduate SUs, and backfill staffing for the experienced RN SUs. The model included increased training time for the new graduate SUs in comparison to the experienced RN SUs, and provided higher levels of end-user support by SUs during the third and fourth weeks after go-live in each ministry. New graduate super users were budgeted to work additional hours, because the proposed plan included utilizing them for more than 50% of the go-live support normally provided. This would enable all staff nurse super users to return to clinical duties two weeks after go-live. The new graduates would also have unduplicated training hours for the first hospital to which they would be assigned; for subsequent hospitals their total hours worked would be lower.

Additional direct expenses incorporated into the cost projections were 12 months of salary and benefits for an experienced Nurse Manager to lead the new graduate SU team, and new graduate sign-on incentives. Projected costs for backfilling super users' clinical shifts in each model were based on preliminary rate quotes provided by the vendors for the purpose of the cost/benefit analysis. The resulting analysis predicted a potential cost savings of 35%, or $5.02 million. Based on this finding, the project was moved ahead for official consideration by executive leaders, who reviewed the cost/benefit analysis and a formal presentation of the proposal (see Appendix F).

Executive approval.

In June 2013, approval of the project was received from the region's Chief Operating Officer, Chief Financial Officer, Operations Council (including chief executives of all hospitals), and the system Chief Information Officer (CIO). Feedback from all executives noted the appeal of a cost-effective solution that also would permit the hospitals to maintain greater clinical staffing continuity, thereby promoting patient safety and clinical quality. Upon receipt of project endorsement, the author convened a project committee to develop a detailed project plan. Appendix G details the roles and duties of project committee members.

Communication structures and processes.

The Epic deployment project model included a local project team to manage facility-specific decisions, coordination and communication for each hospital. A clinical operations leader selected by the facility Chief Executive led each local team. Responsibility for super user workforce arrangements was delegated to the local Clinical Informatics Supervisor (CIS), who worked closely with unit-level nurse leaders to identify and schedule staff nurse super users.

Figure 1 depicts the primary leadership participants in the project, and a general communication matrix. Existing teams and meeting structures, depicted in the background, were utilized as the primary venues for communication. To ensure timely exchange of information between hospitals, regular updates by the RCNIO were added to the standing agendas for the monthly CNO Council meeting. The RCNIO was also invited to participate in the regularly weekly flash calls led by the RCNO every Friday morning. In addition to these conversations with the nurse executives in the region, the RCNIO participated in all five hospitals' local Epic deployment team meetings, and was frequently invited to attend nursing leadership meetings at the hospitals to address any questions or concerns. Biweekly telephone meetings were scheduled for the RCNO, RCNIO and EIT Manager. The RCNO, RCNIO, EIT Manager and hospital CNOs remained in close contact by phone and email, and were free to call ad hoc meetings at any time the need arose. This permissive approach promoted early intervention when problems were identified, and reinforced the collaborative relationships among these nurse leaders.

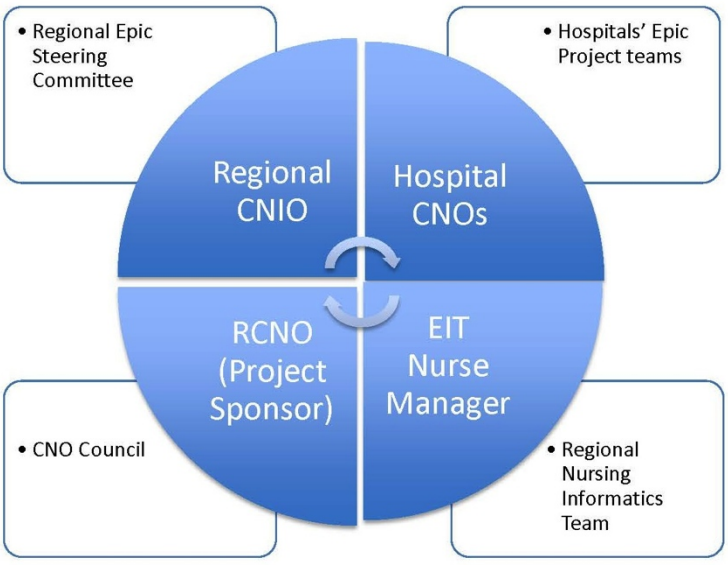


Figure 1. Communication matrix reflecting ongoing dialogue among key stakeholders and existing meeting venues

Project implementation.

Implementation began immediately upon project approval, and involved multiple tasks performed simultaneously by individuals and small subgroups of the project committee. Infrastructure creation extended over several weeks, during which recruitment efforts were also initiated for the Nurse Manager and new graduates. (See Gantt in Appendix H.) For the first 12 weeks, the RCNO served as the operational leader for all aspects of the project, in spite of the plan for the proposed new graduate workforce to report operationally to the RCNIO. The RCNO maintained much of the operational leadership duties until the Nurse Manager could be hired to enable the RCNIO to focus fully on other, time-sensitive Epic implementation duties.

Building the infrastructure.

Initial development of project infrastructure began with creating a job description for the new graduate super users, titled Epic Implementation Technicians (EITs) to distinguish them from experienced RN super users (see Appendix I). Requiring prospective EITs to hold a baccalaureate degree in nursing ensured equity of qualifications for employment within the informatics support team, because the physician support team roles required a bachelor's degree. The Nurse Manager, Epic Implementation ("EIT Manager") job description was developed as a variation of the standard Nurse Manager template, with edits to reflect multi-site supervision of a specialty workforce (see Appendix J). Both new job descriptions were submitted for compensation review, in compliance with organizational policies that require this review before any recruitment activities begin.

Considerations addressed by the compensation review process included assuring a rate for the EITs that would compare favorably with the general market rates for recently licensed nurses, and constructing the total compensation in a manner that would promote retention of the

new graduates through project completion. (This was particularly important to reduce risk of expense overruns that would result from attrition of the new hires after initial training.) The compensation expert positioned the hourly rate slightly below the market, and offset that gap with a sign-on bonus to be paid as a lump sum upon each EIT's completion of at least two Epic go-live cycles. The bonus was characterized as a retroactive sign-on bonus rather than a completion bonus, in order to avoid setting a precedent by introducing the latter type of incentive into the organization's nursing compensation model. The EIT Manager position was assigned a salary grade consistent with existing manager roles bearing similar scopes of responsibility and spans of control. Although both the EIT and Manager roles were characterized as temporary positions, the EIT role was classified as non-exempt, per diem and ineligible for benefits. The EIT Manager was classified as exempt and full-time, which characteristics resulted in benefits eligibility.

Potential barriers and mitigating tactics.

The team identified potential obstacles they might encounter, for the purposes of acknowledging risks openly and developing potential mitigating tactics. The identified potential barriers included:

- problems recruiting or retaining recently graduated nurses,
- conflict with nurse managers related to control of staff schedules, and
- difficulty managing a large pool of staff over multiple geographic locations.

A less obvious risk identified by the project leader was the possibility of lukewarm project support within the individual hospitals and the Epic team, which would reduce the likelihood of successful retention of many of the EITs as staff nurses upon completion of the project.

Agreed-upon mitigating tactics included over-hiring. The project team anticipated the new graduate EITs would also continue their search for employment as staff nurses or RN Residents. Engaging more than the required number of new graduates for each cohort would allow for attrition of up to 10% of new hires before beginning training. The ongoing risk of attrition during the project required contingency plans for hiring and training additional new graduate super users, which would increase total cost by an undetermined amount, but this potential incremental expense was not considered a significant threat to overall project viability. Inclusion of an experienced nurse manager position in the project budget was designed to ensure a dedicated leader to support and guide the new graduates, which would reduce the likelihood of voluntary attrition. A final mitigating tactic designed to mitigate the risk of lukewarm local support was the investment of the project leader's time in frequent, informative discussions with local leadership and the Epic team well in advance of the EITs' arrival on the scene.

Design of staffing backfill plan.

During the next phase of the project, the most complex task arose: coordination of staff schedules to backfill clinical shifts vacated by super users. Backfill of clinical shifts vacated by end users while attending Epic training was a closely related activity, but fell outside the scope of this project. It was recognized, however, as a secondary activity to be accomplished by the same project team, and was included in the project timeline. Development and implementation of super user training and work schedules by the RCNIO was completed early in the project as a necessary precursor to the coordination of backfill staffing.

In light of the hospital CNOs' accountability for ensuring appropriate nurse staffing for the hospitals, support by these nurse leaders was critical to the success of the project. The CNOs and their staffing leaders had already developed facility-specific contingent staffing plans for

anticipated seasonal patient volume increases between November and March. They agreed to support a coordinated regional approach to backfill staffing for Epic, which would run parallel to the hospitals' seasonal staffing plans. One CNO agreed to loan his Staffing Office Manager to the CNO Council as the designated leader for coordination of supplemental staffing contracts and resources for all Epic-related needs. The CNOs also endorsed an intensive recruiting campaign for experienced registered nurses to fill core vacancies before the initiation of Epic training begins. (The campaign for recruitment of experienced nurses is outside the scope of this project.)

Recruiting the new workforce.

Talent Acquisition (TA), a subset of the Human Resources department, was enlisted to tackle the complex recruiting effort that was required for the project workforce. This was a particularly daunting task for that team, which had recently been restructured and consolidated as part of a system-wide, multi-state shared services model with very lean resources and a sole manager for all facilities in the California and Alaska regions of PHS. Upon recognizing the fragility of the TA team as a result of the recent sweeping changes, the author met personally with the new TA manager to explain the unique circumstances presented by the EIT project. The two leaders agreed to partner in leading a team of nurse managers and recruiters to tackle the challenge.

Although the TA team expressed a strong preference for online recruitment as their primary strategy, three of the hospital CNOs had recently experienced success with the more traditional tactic of on-site job fairs. Intense discussions between the CNOs and TA concluded with an agreement to conduct a one-day job fair at an off-site location, and to market the event to a combination of experienced nurses and recently graduated nurses who had a bachelor's degree

in nursing and an active California RN license. Neither the financial expense nor the time commitment required to conduct this recruitment event had been factored into the project plan; nonetheless, the regional COO quickly approved the unbudgeted $25,000 expense, and the CNOs assembled the aforementioned team of nurse managers to collaborate with TA over the five weeks of job fair preparation. More than a dozen nurse leaders participated in planning the recruitment event.

The job fair was scheduled for August 24, 2013, and was heavily marketed by direct mail postcards to targeted zip codes, and a series of brief radio spot advertisements (see Appendix K). The planning team developed an abbreviated interview guide (Appendix L) for use with applicants for EIT positions, and nurse managers from all five hospitals were confirmed as interviewers. Their primary goal was to interview experienced nurses to fill immediate vacancies, and to assist with new graduate interviews if the need arose. The Clinical Informatics Supervisors from each hospital comprised the primary interview team for the EIT applicants, and would be supported by the RCNIO.

On the day of the event, there was a queue of more than 30 recently licensed nurses waiting for admission more than one hour before the event was scheduled to begin. Total attendance by prospective applicants exceeded 400, of which more than 300 were new graduates. The event planning team convened in periodic strategy huddles throughout the event to adjust their assignments and workflow to accommodate the deluge of walk-in applicants. Nurse managers who were disappointed by the relative dearth of experienced nurses in attendance had little time to reflect on that concern, because they were immediately tasked with interviewing EIT candidates. Meanwhile, a waiting area seated approximately 100 hopeful applicants as they were welcomed by the RCNO and HR staff in hourly presentations about the EIT program, the

mission and values of the organization, and potential future opportunities for new nurses to become part of the PHS team. Particular emphasis was placed on the vision statement of PHS, "Know me, care for me and ease my way" as a prelude to the team's commitment to interviewing every applicant, some of whom waited several hours for that opportunity. The most frequently asked question from the new graduates was whether they would be guaranteed employment as RN Residents upon completion of their EIT duties. The response to the question was consistently "no" but encouraging, as the nurse leaders talked about the competitive advantage the EITs would have as expert users of Epic.

The results of the job fair are summarized in Appendix M. Offers of temporary employment as EITS were extended to 98 candidates, contingent on successful completion of background checks, license verification and drug screening. As the offers were extended orally, candidates were asked to specify whether they preferred a start date of November or January, and those wishes were honored when possible. Hospital #1, for which the November cohort was being hired, required 60 EITs to begin work on November 18, 2014. Because competitor hospitals were advertising RN Residency programs beginning in the fall, offers were extended to 67 candidates in anticipation of some attrition prior to the EITs' scheduled start date.

Recruiting the Nurse Manager.

Finding the right leader for the new graduate workforce was challenging due to the fiercely competitive local employment market and the temporary nature of the position, which was budgeted to exist for only one year. The only applicants that responded during the first several weeks after the position was posted lacked sufficient prior leadership experience. With less than a month remaining until the orientation of the first EIT cohort, increased networking

activity by nursing leaders led to identification of an experienced nursing director who had been temporarily out of the workforce for personal reasons. She responded quickly to a phone call by the recruiter; within a week she was interviewed, hired and scheduled to start work just two weeks before the arrival of the first cohort of EITs. This short cycle time required the new hire to exhibit strong initiative and self-sufficiency, as those two weeks were barely sufficient time to develop work schedules, set up an office, and find the five hospitals before welcoming her first group of direct reports.

Recruitment process change.

Over the ensuing 8 weeks, TA was expected to hire additional EITs to ensure Hospital #2 would have a full cohort of 55 when training began in early January 2014. By this point nurse managers were increasingly caught up in Epic-related preparations at their respective hospitals, and were not available to interview EIT candidates. The Clinical Informatics team was also fully occupied with Epic preparations, and unavailable for other work. The project team authorized TA to perform the entire screening and selection process, utilizing the existing standard interview tool via telephone or video-call (e.g. Skype) to evaluate prospective candidates. All positions in the second cohort of EITs were successfully filled by early January, in spite of attrition of nearly half the prospective employees hired in the fall, due to their having taken jobs elsewhere.

Integration of the new workforce into the organization.

The Nurse Manager and CNIO collaborated to develop orientation and training programs for the EITs, and met weekly with the RCNO to update her as the project evolved. The three leaders shared the desire to promote retention of the EIT workforce through the Epic implementation and the hiring of RN Residents. They cultivated an environment of open

dialogue and immediate responsiveness to employee concerns, and expected the same timeliness and compassion to be exhibited by the EITs toward staff who were learning to use the new EHR. As Executive Sponsor, the RCNO made a brief presentation to each cohort during orientation, and brought ice-cream bars for the EITs as a small gesture of celebration as they completed the orientation.

Additional strategies to ease the integration of the new employees included designating a unique dress code for the EITs, to enable other employees' recognition of them. Simultaneously, the author met with the CNO and nurse leaders at each ministry to discuss the role of the EITs as both super users and prospective future RN Residents. The discussion included a strong emphasis on creating a welcoming environment and proactively reaching out to meet the new graduates as they arrived at the facility. This message was echoed in an email that was sent to the first hospital's executive team, with the request that they encourage all hospital staff to welcome the new graduates enthusiastically. Two weeks after the EITs' arrival to support end-user training activities, during a visit by the RCNO the EITs reported proudly that staff seemed very happy to see them, and had even given them special nicknames, "the Gap kids" and "tan pants". These monikers were in playful acknowledgement of their youthful appearance and preppy wardrobe of khaki pants and white, collared shirt.

Further integration of the EITS into the PHSCA team evolved organically during the weeks leading up to the first Epic go-live. In addition to providing end-user support in the classroom training sessions, the EITs staffed the playground, a vacant clinical unit that was set up for patient documentation simulation using a variety of scenarios set up in Epic. All nurses were instructed to spend 12 hours of playground time to become familiar various documentation tools and scenarios before the system became active. As nurses arrived to avail themselves of

that opportunity, they were greeted by an EIT who offered immediate assistance whenever needed.

Technical and workflow dress rehearsals were additional project phases during which the EITs worked side-by-side with the staff nurse super users. The dress rehearsals were designed to load test the system and the staff, to identify and correct technical or workflow problems before go-live. The final phase of preparation supported by the EITs was cutover. During this critical last activity prior to go-live, staff nurse super users and EITs participated in the building of new medical records in Epic for all patients currently in the hospital. This labor-intensive task engaged staff from finance, patient registration, information services, pharmacy and nursing most intensively, as they literally built each record from registration, through all physicians orders and transitions of care to the present state (see Appendix N). For this effort, most of the EITs were paired with the experienced nurse super users, further reinforcing their team identity.

The first indicator of unquestionable success came about 36 hours after go-live at the first hospital, when the command center received a frantic call from a nurse manager. The manager was described as being in a panicked state as she asked, “Where’s my tan pants? I don’t have any super users!” Hearing the response that she was fully staffed with experienced nurse super users, so hadn’t been staffed with any EITs, the manager replied, “But you have to send me someone! The tan pants are the ones who really know the system and we can’t do it without them!” (personal communication, K. Alfe, January 19, 2014). Positive feedback about the new graduate super users was quickly shared throughout the multi-hospital system, which facilitated the integration of the additional EITS as they arrived. Their positive image was further reinforced when the first group of EITs began providing support for the third go-live event, by which point

they had completed one entire go-live cycle and were fully competent and confident in their EIT role.

Planning the Study of the Intervention

Plans to assess the effectiveness of the project were not as robust as plans for implementation. As will be discussed later, that led to unexpected challenges in quantifying some of the outcomes. The primary objective of the entire project was to ensure sufficient super user support to end-users during training and implementation of the new EHR, at a lower total cost than that of the standard super user workforce model. The indicators of effectiveness for this objective were super user staffing at the prescribed ratios during training and implementation, nursing cutover duties completed by deadline, and actual super user labor expense as compared to calculated labor expense for the standard super user model.

The first two indicators would be monitored concurrently. Super user staffing would be coordinated by the Nursing Informatics team and adjusted as needed (e.g. to cover unexpected absences). Nursing cutover work performed by the EITs working with staff nurse super users would also be handled by Nursing Informatics leaders, and would offer a single observation: completion of all cutover work before scheduled go-live time. The primary outcome measure by which success of the project would be determined is the total expense for super users and contract labor backfill of their vacated clinical shifts during the Epic implementation by PHSCA. This would be measured in the aggregate at the conclusion of each hospital's formal implementation cycle (through four weeks post-go-live). On a more granular level, the EITs' worked hours would be tracked by the Nurse Manager on a weekly basis, with actual or anticipated variances reported to the RCNO.

Achievement of the intended outcomes would be dependent upon meeting the milestones identified in the project timeline (Appendix H). Key milestones for the project were bound tightly to the Epic implementation schedule, and reflected a cyclical pattern of hiring the EIT workforce for each hospital in sufficient time to compete their orientation and training no later than eight weeks prior to the hospital go-live date. Beginning in November 2013, each cohort of EITs would spend eight weeks supporting staff training and technical preparations, followed by four weeks of go-live support. The second cohort of EITs was expected to pose challenges related to recruitment, orientation and training because of historical recruitment difficulties from late November to early January, and the potential to lose early hires to competitor organizations due to the long time gap between hiring and start dates.

Retention of the EIT workforce was identified as an important determinant of project success, both operationally and financially. Unexpected turnover would potentially compromise super user staffing, and replacing the EITs would result in increased onboarding expenses for orientation and training of new hires. Finally, the overall success of each hospital's Epic implementation was an essential foundation upon which to pursue meaningful use attestation success; super user effectiveness would be one of numerous contributors to that overall outcome, but would not lend itself to being validated by meaningful use outcomes.

PHSCA's quality improvement method of Plan, Do, Study, Act (PDSA) model served as the framework for development and monitoring the indicators of project effectiveness. An example of this framework's use was the modified recruitment process, which was implemented upon identification of barriers to replicating the original recruitment process utilized for the first cohort of EITs. The modified interview tool had been validated as useful for screening candidates, and selection of the EITs by nurse managers and recruiters had been successful even

though they were not informatics experts. This led to the Plan (modify the recruitment process), Do (conduct recruitment utilizing the new process), Check (measure the results) and Act (adjust or continue the process as indicated by the results).

Yet another indicator of project success would be changes in nursing leadership behaviors related to hiring RN Residents after completing Epic implementation. Their introduction to the project during leadership meetings opened the door by the RCNO noting that EITs would become expert users of PHSCA's EHR, thereby reducing the training needs of EITs hired as RN Residents. Similarly, the integration of the EITs into each ministry's super user team could stimulate greater acceptance of recently graduated nurses as a result of relationships developed during the Epic implementation. Outcomes related to hiring new graduates would not be fully realized during the project timeline, as the optimum impact would not be expected until all five hospitals had completed their Epic implementation cycles.

Methods of Evaluation

The primary outcome measure by which success of the project would be determined was the total expense for EIT, super user and backfill staffing during the Epic implementation by PHSCA. That would be compared with the calculated expense that would have been incurred using the standard super user workforce model. Measurement was planned to occur on completion of each hospital's implementation cycle, beginning with super user training and concluding four weeks after the actual go-live. The rate of retention of EIT super users was the second measure of project success, and would be a partial driver of total cost. Attrition would require either replacement of the departing EITs with additional new graduates, or increasing the number of experienced staff nurses reassigned to the SU role at the impacted hospital(s). The former approach would produce increased labor expense for the EIT SUs due to initial

orientation and training required for the new hires. The latter option, increasing the number of experienced staff nurse SUs, would increase the number of contract staff required to backfill clinical shifts.

A final measure of project success would be retention of new grad SUs as RN Residents during or after project completion. The ideal outcome would be filling all available RN Residency positions between June and December 2014 with EIT super users. This would ensure that all RN Residents would begin employment with advanced proficiency in use of the EHR, thereby yielding savings in the form of reduced residency curriculum hours. A longer term measure of project success would be retention rates for the EITs hired as RN Residents, in comparison to retention rates for new graduates employed as RN Residents without first serving as Epic super users. (This long-term measure falls beyond the scope of the original project, but remains available for future study.)

Analysis

The quantitative nature of the primary project outcomes ensured a relatively simple analysis of results. A designated financial analyst would determine actual labor costs for EITs and RN super users by accessing electronic payroll files. Contract labor costs for Epic backfill staff would be tracked by the designated Staffing Office Manager based on invoices for actual hours worked. Attrition would be tracked by the Nurse Manager for the EITs, and validated by Human Resources in the event of any data gaps. None of these efforts would require special software.

Section IV: Results

Program Evaluation

Evaluation of the project occurred in September 2014 and focused on three types of outcomes.

1. Financial outcomes were demonstrated by net labor expense avoidance.
2. Workforce outcomes consisted of retaining EITs as clinical staff by hiring them as RN Residents in the 2014 summer and fall cohorts. Although only immediate retention falls within the scope of this project, there is a potential long-term retention benefit if the three-year retention rate for these RN Residents is consistent with the PHSCA historic rate of at greater than 85%.
3. Cultural outcomes, the most difficult to measure, were the most sustainable result of the project. Nurse leaders and clinical staff in nursing and allied health have experienced increased exposure to recently graduated RNs in a positive context. The phenomenon of situated social cognition is expected to promote receptivity to new, inexperienced clinicians as a result of this positive experience.

Financial outcomes.

The primary objective of the project was to demonstrate cost-effectiveness by at least a 15% reduction of expenses for the super user workforce and backfill staffing, as compared to the cost of the standard super user model utilized in all other regions of PHS and consistent with vendor recommendations by Epic. Based on prospective financial modeling, the anticipated savings of $5.02 million equated to a maximum cost avoidance opportunity of 35% in comparison to the cost of the standard super user model. The target of this project was considerably lower than the theoretical maximum opportunity because of the risk that variables

beyond the author's control would increase expenses. Examples of such variables included attrition of EITs during the project due to aggressive recruitment by competing organizations, and unanticipated EIT overtime expense resulting from end-user need for remedial training.

The process of measuring financial outcomes was more difficult than expected due to accounting structures and processes that aggregated Epic labor expense into a single account. The Epic implementation was structured financial as a capital project. Collateral expenses associated with the project, but not included in the capital funding plan for Epic, were booked as operating expense allocated to the region and to individual hospitals. As a result, project expenses were dispersed across a variety of business entities and cost centers, complicating the analysis. Super user labor costs for EITs and RN SUs were allocated to the Epic project capital budget. Contract labor expense for backfilling clinical shifts was allocated to the hospital department-level operational cost centers in which the hours were worked. There was no provision for coding the latter operational expenses to distinguish super user backfill staffing from backfill staffing to replace other nursing personnel while they attended end-user training.

Total labor expense for the project included EIT labor, RN super user labor, contract labor to backfill clinical shifts of RN super users, EIT incentive payments, and salary of the Nurse Manager. Analysis of financial outcomes began with collection of EIT labor expense data, which was easily accessed in the payroll system by using the unique EIT job code as a search term. Review of the data revealed unbudgeted expenditures for premium pay in the form of overtime and occasional double-time hours. Shift differential costs were another category of expense that had not been included in the prospective financial modeling. An additional unanticipated expense was attributed to EIT hours spent performing non-super user functions during their scheduled breaks from super user duties between hospital project cycles. These

breaks provided the serendipitous opportunity to leverage the EITs as a cost-effective alternative to IS contract labor for Epic-related tasks outside the scope of the project. The additional savings thereby achieved were included in the final analysis as a separate line item.

Experienced RN super user hours were the most difficult financial outcome measure to capture. As noted previously, these hours were expensed to the Epic project budget. That cost center also held all training expenses for end-users, and it was not possible to segregate the super user labor expense from the aggregate expense pool without a performing a labor-intensive manual review of super user lists and timesheets. The manual review was ruled out as cost-prohibitive; the Nurse Manager and author developed an alternative method for calculating actual expenses incurred. A sequential process, which is depicted in Figure 1, was utilized to calculate actual RN SU labor expense incurred for the project.

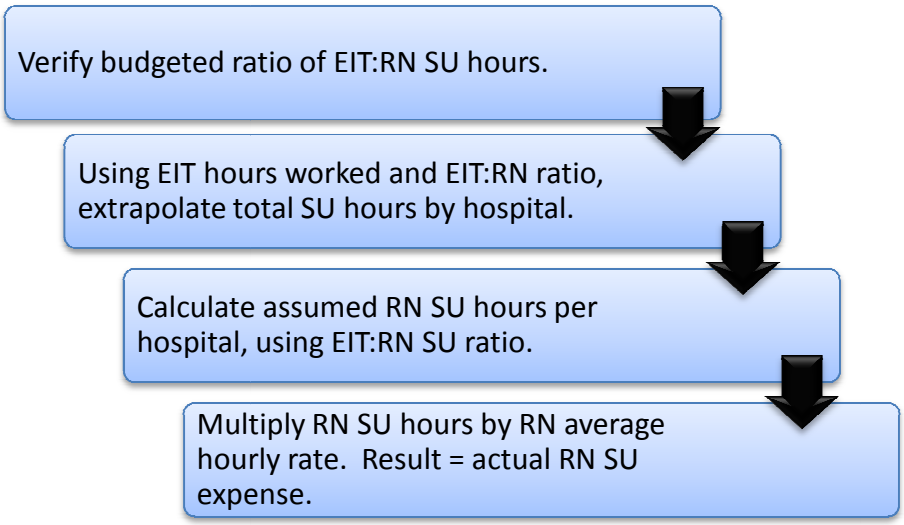


Figure 2. The first step in the process produced a ratio of 63% EIT: 37% RN SU. The ratio was the foundation for determining RN SU hours worked by hospital, which were then multiplied by the hospital's average hourly rate (AHR) for experienced RNs to produce total expense by facility.

The third component of project expense was contract labor backfill of clinical shifts vacated by RN super users. Once again, the aggregation of expenses into a large cost center prevented direct measurement of actual expense incurred. The total expense for contract labor to backfill clinical shifts included coverage for end-user training hours as well as super user hours. Backfill labor expense was calculated by multiplying RN super user hours by AHR for contract labor, by hospital. The total of EIT, RN super user and contract labor expense for the five hospitals plus EIT incentives and Nurse Manager salary was $10.3 million.

After determining actual total labor expense incurred, a retrospective calculation of the projected costs for the standard super user model was performed based on the actual total hours worked. Assumptions were that RN SUs would have worked all the super user hours, and would have required contract labor backfill for those hours. Figure 3 depicts the relationship between costs of a standard super user model and actual incurred expense by hospital, revealing that the primary expense avoidance was contract labor backfill of super user shifts.

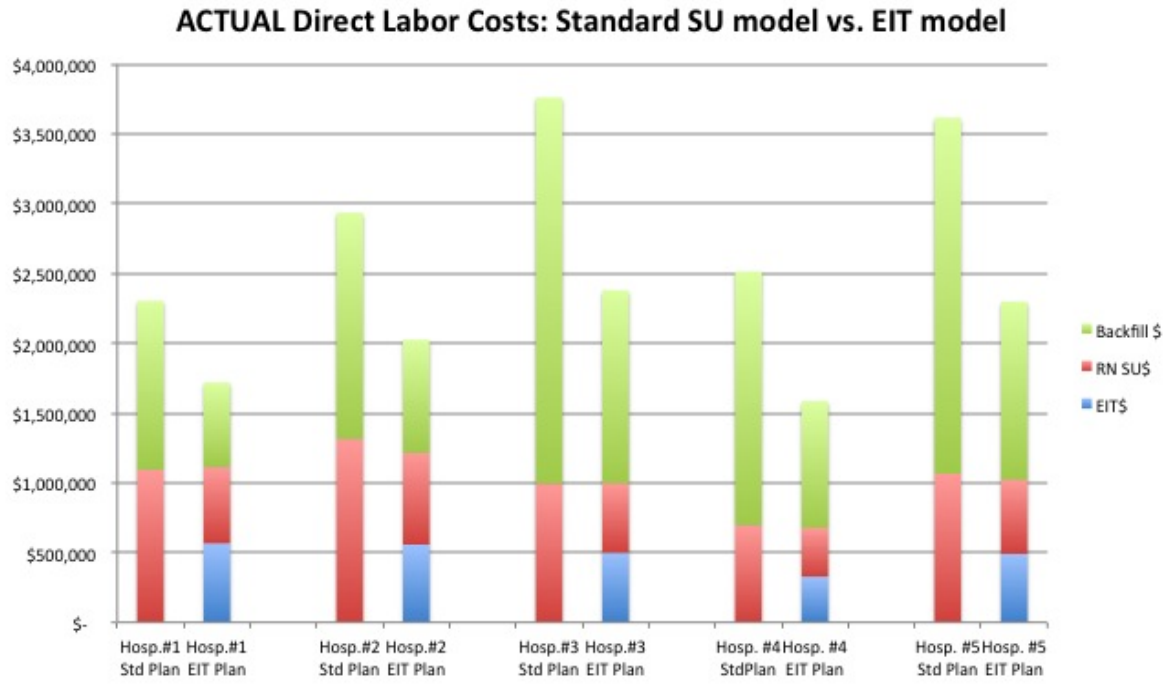


Figure 3. Comparison of projected cost for standard super user model with actual cost of using EITs as half the superuser workforce.

The calculated total for the standard approach was slightly more than $15.1 million. This confirmed that the project goal of at least a 15% savings on super user labor and backfill was achieved; the project provided 35% more super user support hours at a cost of 31.8% less than the standard super user model. (See Table 3.) Inclusion of the additional cost avoidance achieved for non-super user IS work would increase the savings to 32%.

Workforce outcomes.

Secondary project objectives were to retain a sufficient number of new graduate super users after Epic implementation to fill all available RN Residency positions in summer and fall of 2014. Employing the new graduates as clinical staff enabled the organization to retain their

expertise as end-users, and to reduce RN residency training hours by 24-40 hours per nurse, depending on the clinical settings into which the RN residents were hired.

At the height of the project, during which a third cohort of EITs had been hired to support the implementation of Epic at two hospitals simultaneously, there were more than 150 EITs on the payroll. The first cohort originally included 64 hires, although four of those EITs withdrew before starting work due to having accepted offers of employment elsewhere. The remaining 60 supported the first hospital go-live, then moved to Hospital #3. One more EIT resigned during that transition, leaving 59. Hiring for the summer RN Residency commenced urgently in March when the Nurse Manager reported that many EITs in this cohort were pursuing RN Residency positions at competing hospitals. In spite of a guarantee of employment as RN Residents, which guarantee was made by the RCNO and communicated by the Nurse Manager, nine of the 59 accepted positions outside the organization. Of the remaining 50, 48 were hired into the RN Residency that began in June 2014, and one (who was not accepted by any of the hiring nurse managers) accepted a position on the Clinical Informatics team. The final member of the cohort was unable to accept a clinical position due to her impending childbirth in mid-summer; she was subsequently hired for the fall RN Residency at Hospital #1. Net retention of this first cohort of EITs as RN Residents was 82%.

Retention of the second cohort of EITs was more challenging. Early learning about attrition before start of employment led to the hiring of 62 new graduates to ensure that 55 would be available to support Hospital #2. Unfortunately, two new variables were introduced. First, the timing of this cohort's start date in January 2014 coincided with early recruitment of RN Residents by two major competitors, both of whom had scheduled RN Residency programs to begin in March. A second factor that may have influenced the employee-employer relationship

was the modified hiring process utilized for the second cohort. The selection process was performed by Talent Acquisition staff, who relied solely on telephone and videoconference interviews. There was no contact between nurse managers and the candidates during the hiring process. As early as the first day of the EITs' orientation, the Nurse Manager noted "They seem less excited and more demanding" (K. Alfe, personal communication, January 7, 2014). In contrast with the first cohort, the general tone of the second group was ambivalence, and the Nurse Manager was barraged with special scheduling requests and other demands related to working conditions. (One EIT went so far as to complain bitterly upon discovering she had been assigned to work in the behavioral health setting.) By comparison, the first group of EITs had frequently expressed appreciation for the work experience and flexibility with respect to schedules and work settings, so the general sense of entitlement expressed by the second cohort came as a surprise to the Nurse Manager and author.

Within a few weeks of beginning their employment, 23 of the EITs in the second cohort had accepted RN Resident positions elsewhere. Three more eventually left for similar opportunities, and three were hired into the summer 2014 PHSCA RN Residency for openings at Hospital #2. Only 36 EITs in this group remained available to support a second go-live, for a retention rate of 63% (including the three hired as RN Residents) as of August 2014. This was not entirely unexpected, due to the combination of the previously noted characteristics of the group and the fact that there was no guarantee of employment after completion of the Epic project. The latter condition was due to the organization's inability to ensure enough future new graduate positions to place all of the EITs, although hiring of RN Residents for an October 2014 start date was underway as this report was written.

The third cohort of EITs was hired to support the Epic implementation at Hospital #4, the smallest of the five PHSCA hospitals. Only 35 EITs were required for this facility; 43 were hired in anticipation of attrition. Although a sixth hospital had been acquired by this time, with expectations of an August Epic go-live that would be supported by the third EIT cohort, that event was postponed until November, thereby eliminating ongoing work for this group. Eight of these EITs were successfully recruited by other organizations, and two were involuntarily terminated for performance issues. At the time of this report, all 55 EITs who remained employed by PHSCA were candidates for the October RN Residency program and actively supporting Epic preparations at Hospital #6, and 40 of them had been selected. This dynamic situation precluded calculation of an accurate retention rate.

Cultural outcomes.

The subtle impact of the EIT project on the organizational culture, although less easily observed than financial workforce outcomes, may be the most sustainable result. The extent to which the project impacted attitudes and beliefs was not measured directly; rather, the author observed behaviors and interpreted them within the context of prior and current organizational experiences. The results were necessarily subjective, and not validated by use of any instruments designed to measure attitudes or beliefs. Local outcomes may not be broadly generalizable, due to the distinct local cultures of the five hospitals in which the project was conducted.

At the regional executive level, the project was approved and implemented within six months of the arrival of a new hospital division Chief Financial Officer (CFO). This individual previously worked in the for-profit healthcare sector, and was widely known within PHSCA for his reluctance to attribute to nurse leaders the characteristic of fiscal prudence. Through the course of the EIT program, he gradually become more receptive to suggestions from the about

unrelated projects or programs, which suggested a greater openness to nursing as a business partner. The CFO also abandoned his long-standing opposition to RN Residency programs because he believed they were a costly luxury rather than a necessity. He has been notably silent on that issue since the implementation of the EIT project.

The unit level nurse managers in 4 of the 5 hospitals were previously conservative when encouraged to hire recently graduated nurses, and often cited patient safety as the reason for limited hiring of RN Residents. Increasing pressure from the CFO to fill chronic vacancies and the opportunity to witness recently graduated RNs as confident, successful Epic super users likely combined to soften nurse managers' opposition to embracing RN Residents as essential members of the nursing team. This subtle shift was likely enabled by the managers' observations of the positive interactions between the EITs and experienced nurses. The EITs effectively infiltrated the unit-level environment with their youthful energy and technical competence, making themselves an indispensable resource to other staff.

The Talent Acquisition team in the Human Resources department was also impacted by the EIT project. The job fair success and subsequent access to a large internal pool of applicants for RN Residency positions required the rapid development of new workflows for selection and hiring of large numbers of employees. The extent to which this experience expanded the team's capacity for rapid-cycle change will be demonstrated over time, and will be strongly influenced by the internal conditions in Human Resources, which is organized as a system-wide shared service. Regardless of the sustainability of such flexibility, though, the value of a collaborative partnership with nursing has been demonstrated, and there is an increased openness and flow of information between nursing leadership and TA since the initiation of this project.

Unanticipated outcomes.

The presence of the EITs during Epic go-live at Hospital #5 catalyzed recognition of an additional opportunity to leverage this unique workforce. PHSCA planned to utilize the last possible 90-day period to collect attestation data for Stage 2 meaningful use incentives. The period began on July 1, 2014, only 16 days after go-live of Epic at Hospital #5, and less than six months since the first PHSCA Epic go-live. Meeting criteria for the 2014 incentive amount of $6.4 million required an intense effort by clinical operations, medical staff and finance teams. Leaders agreed that additional resources were needed to support patient recruitment for use of the Epic patient portal. Use of the portal by discharged inpatients was required to satisfy MU objective H219B. From May 30 to June 10, 2014 EITs trained Mother/Baby nurses at four hospitals to teach patients to use the Epic patient portal. Staff training was the foundation of a pilot to engage new mothers in using the portal to retrieve their test results (lab, imaging and pathology), problem list, related education, patient medications, and more. Prior to enlisting the EITs in this effort, compliance with objective H219B ranged from 3% to 6% across the four hospitals, posing a threat to attestation for incentives. After staff training, H219B compliance rose to 12-21%, a safe range for attestation success. Figure 3 depicts the improvement on the four measures that posed the greatest threat to successful attestation.

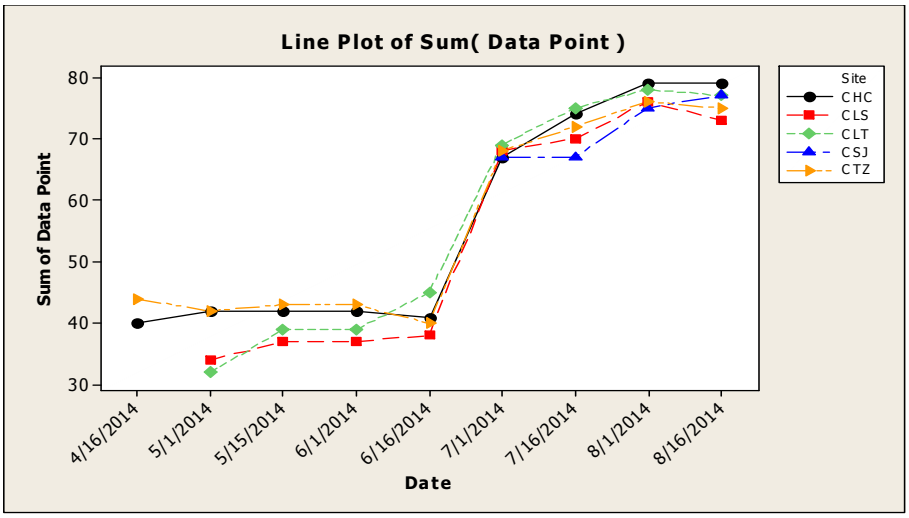


Figure 4. MU compliance by PHSCA for the aggregate of objectives H210, 219B, 224A and 232. During the two weeks ending 6/16/2014, EITs trained Mother/Baby nurses.

On September 30, 2014 the region's MU project manager reported the attestation period had ended with success on all objectives, and cited the EITs' contribution as a critical driver of the outcome.

A second unplanned outcome of the project was healthcare media interest in the program. The interest was triggered by a press release (Appendix O) produced by PHSCA Marketing and Communications staff on June 4, 2014. The article was picked up and featured by *Catholic Health World,* a publication of the Catholic Hospital Association, and *Angelus*, an online publication of the Archdiocese of Los Angeles (see Appendices P and Q). It was also mentioned in multiple internal publications at the regional and system level. The most detailed article about the project was a feature story in *Providence Health*, a quarterly publication by Providence Health and Services that is distributed by direct mail to consumers and providers throughout the Providence market area. (See Appendix R.) During every interview of the author, reporters expressed great interest in the use of novice nurses skilled in using technology to coach experienced nurses of an earlier generation.

A final unanticipated outcome was the discovery that many of the recently graduated nurses hired as RN Residents after serving as EITs had difficulty adjusting to a clinical role. In several cases, nurse managers reported that the new employees appeared to have "lost" or forgotten some of the clinical skills acquired during their student experience. These observations were more common among RN Residents who had graduated more than 12 months prior to beginning employment as EITs. Although PHSCA educators and nurse leaders were disappointed by this discovery, most acknowledged they were not surprised, in hindsight, that extended time gaps between graduation and entry into practice had eroded skills retention among new graduates. Several of the RN Residents in the June 2014 required additional clinical training time early in their residencies, and one RN Resident resigned from the program, citing her realization that she didn't like clinical practice. In anticipation of welcoming many EITs into the October 2014 cohort, RN Residency educators quickly revised the program curriculum to accommodate individual remedial clinical skills training on an as-needed basis.

Section V: Discussion

Summary

The project was successful on multiple levels. It produced the intended outcomes of cost effective super user support and employment of EITs as RN Residents. As a disruptive innovation, it also exposed leaders of finance, nursing, human resources and technology teams to the benefits of questioning the status quo. Implemented during a period of rapid change in the enterprise organizational culture, the project exemplified the type of educated risk-taking and rapid-cycle implementation encouraged by the relatively new enterprise CEO. Success was dependent on widespread acceptance and support by system and regional teams, as well as constructive engagement of local teams at the individual hospitals. This widespread exposure of diverse teams to the EIT program required all teams to quickly adapt, reinforcing a culture of adaptive learning and flexibility.

Relation to Other Evidence

The EIT project validated themes in the evidence related to the importance of the super user role in promoting full adoption of EHR technology. Successful attestation to Stage 2 MU objectives within months of implementing a new EHR would not have been possible without highly effective support for end-users. Prensky's concept of digital natives (2001a; 2001b), although not tested scientifically by this project, seemed pertinent to the rapid engagement of the EITs as skilled Epic super users within a very short period. Their ease of use and enthusiasm about the technology may have promoted acceptance of Epic by nursing end-users, thereby demonstrating the expectation-continuance theory posited by Bhattacherjee (2001). Situated social cognition theory, as described by Smith and Semin (2007) explains the increased

receptivity of nurse managers to hiring new graduates after exposure to the EITs as competent coaches and end-users of the EHR during the Epic implementation.

Limitations

The primary limitation of the project was the brevity of the observation period. The post-go-live support period for Hospital #5 ended in mid-July 2014. Concluding the project after the initial Epic implementation precluded opportunities to evaluate the full extent of technology adoption over time. A more extended timeline would also have allowed for evaluation of long-term retention rates for EITs hired into the RN Residency program, and comparison of those rates with RN Residents who were not EITs before entering the program.

A secondary limitation that arose at the end of the project was difficulty sustaining the robust EIT super user model at the sixth PHSCA hospital. Although this hospital was beyond the scope of the project, it bears mention because IS and nursing leaders planned to utilize an identical super user model that combined EITs with RN super users in equal numbers. The replication opportunity was disrupted by mass hiring of the incumbent EITs as RN Residents for the October 2014 program. The program was scheduled to begin just one week prior to the Epic go-live at Hospital #6, effectively eliminating the availability of 73% of the EITs that were scheduled to support the final go-live. At the time of this report, negotiations were underway between the Education team and EIT Nurse Manager to explore the possibility of postponing the RN Residency launch by one month, to ensure adequate super user support for the Epic go-live.

Interpretation

Although deemed successful based on outcome metrics and anecdotal feedback, retrospective review of the project revealed organizational process weaknesses that may have impacted the outcomes. One example of such weaknesses was the process of RN Resident

selection for the June 2013 cohort. TA had recently utilized on-line interview methods to hire the second group of EITs, and recommended a similar on-line screening by nurse managers to aid placement decisions for EITs in the RN Residency. The technology was not consistently effective, and was eventually abandoned, at which point the candidates were scheduled for face-to-face interviews that competed with their EIT work schedule at Hospitals #3 and 4. Another process challenge was identified in the finance department, where workload and current analytical systems did not accommodate tracking of EIT and RN super user expenses separately from other Epic labor expense. Both process challenges were helpful in identifying infrastructure limitations that might confound management and measurement of future innovative initiatives.

Conclusions

The super user workforce project utilizing new graduates to support EHR implementation was a cost-effective initiative that also succeeded in demonstrating to internal stakeholders the value of evidence-based disruptive innovation within PHSCA. Leveraging local workforce conditions and internal talent resulted in EHR implementation success, as evidenced by Stage 2 MU attestation, and enrichment of the clinical workforce by hiring EIT super users into the RN Residency program. The project led to collateral opportunities for marketing PHSCA as an innovative employer and healthcare organization.

Section VI: Funding

All funding for this project and any future related publication was provided by PHSCA. Incidental support activities not included in the project budget (e.g. media relations, accounting, etc.) were provided by internal resources performing their usual and customary duties.

Table 1

Evidence Table

STUDY	PURPOSE	METHOD	SETTING & SAMPLE	FINDINGS & RELEVANCE	EVIDENCE STRENGTH & QUALITY
Factors affecting adoption/implementation of technology					
(Gagnon et al., 2012)	Explore factors that can facilitate or limit implementation of information or communication technologies in clinical setting.	Systematic review of mixed method studies. Narrative synthesis, categorization of factors.	Cochrane review >49,000 references, full text retrieved 244, 106 published, 101 studies eligible	Perceived usefulness, ease of use and utility of EHR are main factors contributing to successful implementation. Lack of familiarity and inadequate or lack of training are main barriers. Validates significance of super user support for end users for EHR implementation.	I A
(Granlien & Hertzum, 2012b)	Investigate mid- and lower-level managers' perceptions of extent to which staff have adopted EHR and identify barriers to same.	Survey via online questionnaire, participation requested by email to managers, EHR coordinators. Responses anonymous.	Danish health care system, 2 hospitals. 430 surveys sent, 232 responses (54%) from 94 physicians, 129 nurses, 9 others)	Barriers to ease of use and usefulness were identified as primary barriers to adoption -- indicating a combined social-technological approach might be useful to promote adoption. Key finding: clinicians establish quickly how they will use technology and tend to stay with that approach, so getting them to effective use early is important. Support for ease of use, and to influence perception of usefulness is important.	III A
(Halbesleben, Wakefield, Ward, Brokel, & Crandall, 2009)	Examine association of super user attitudes toward CIS with employee experiences of CIS implementation	Survey super users and employees, and limited number interviews	Midwestern U.S. hospital, 200 beds, 2750 employees, post-CIS implementation. 82 super users, 325 employees surveyed	Time spent in super user role and super user characteristics positively correlated with end-user attitude related CIS. Validates importance of investment in developing super users by both time in role and attitudes toward technology being implemented.	III A
(Pare, Sicotte, Poba-Nzaou, & Balouzakis, 2011)	Study impact of clinicians' early perceptions of organizational readiness for change.	2 cross-sectional surveys to explore 4 categories of perceptions of RNs and MDs	11 Home Health organizations, one large teaching hospital. Over 400 surveys sent, 54% response rate (235)	Inconclusive, recommendation for more studies. Researchers speculate that clinical end-users' feelings about technology's usability may influence their perceptions of organizational readiness for implementation. Implies potential to positively affect perceptions of organization readiness if super users positively	III A

				impact end-users early perceptions of EHR usability.	
(Mair et al., 2012)	Identify barriers, facilitators to healthcare IT, and gaps in research	Meta-analysis published studies	37 studies	Common finding; emphasis on importance of adequate training and support for users. Reinforces value of innovation to strengthen end-user support and training.	III B
(Whittaker, Aufdenkamp, & Tinley, 2009)	Investigate barriers and facilitators to implementation of EHR as perceived by nurses	Qualitative, descriptive study utilizing validated tool to guide analysis of interview response content.	Rural hospitals in Midwest. Small sample size (11 RNs) from two units, median age 40, all Caucasian.	Interviews conducted 30-60 days after implementation of EHR. Availability of super users ("super trainers") and strong peer support among staff were identified as nurse-related facilitators of their acceptance of EHR.	III B
(Simmons, 2013)	Utilize case study to demonstrate the value of super users to support implementation of EHR.	Case study, nonprofit teaching hospital in Virginia.	One hospital site, 342 beds.	Researcher concludes super users essential element of successful implementation project, and "instrumental" to success in meaningful use attestation for Stage 1. Super users cultivate positive attitudes (of staff) toward change and adoption of new technology.	III C
Technology skills of new nurses, super user characteristics					
(Choi & De Martinis, 2013)	Examine informatics competencies of undergraduate and graduate nursing students	Qualitative descriptive study of nursing students in one Massachusetts university's 4 programs (3 undergraduate, 1 DNP)	289 nursing students (154 graduate, 125 undergraduate). Response rate 56.9%.	Grad students reported higher competency in informatics, both levels of students competent in basic skills, attitude toward informatics and skills with wireless devices.	III A
(Fetter, 2009)	Assess the self-reported information technology skills of graduating baccalaureate nurses	Survey related to 43 novice nurse competencies used by senior nursing students to self-rate their level of skills.	Senior nursing students, 42 respondents = 52% response rate for graduating class at Villanova University.	Students recommended increased access to technology during nursing programs (although responded negatively to question of whether technology exposure should replace some of clinical hours). May demonstrate "before" conditions (with more current literature representing "now") related to IT in nursing programs.	III C
(Kaya, 2011)	Identify factors affecting attitudes of nurses toward computers in	Cross-sectional study of purposive sample of employed nurses	890 nurses employed at two hospitals (one state, one	Researcher confirmed hypothesis that nurses' attitudes toward adoption of computers in their work	III A

	healthcare	in Turkey.	university). Mean age 34, 99% female.	directly impacts degree of success of computer implementation. Noted differences in attitudes by age, marital status, nursing education, and previous use of computers.	
(McNeil et al., 2003)	Assess existence & perceived importance of IT knowledge, skills in graduating nurses	Qualitative & quantitative. Online survey deans, directors schools of nursing (BSN programs)	Survey sent to 100% sample of 672 schools of nursing U.S., Puerto Rico. 266 responses (40%).	Strong perceived need to include IT knowledge, skills development in BSN curricula, especially strong in Pacific states. This early recognition (>10 years ago) suggests likelihood BSN graduates will have foundational knowledge of IT)	III B
(Oliveira & Martins, 2011)	Fill gap in knowledge of technology adoption models at firm level and discuss two prominent models (DOI and TOE)	Review of literature technology adoption models at firm level. Explore all studies of DOI or TOE in combination with other models.	Approximately 20 studies identified in tables, no narrative comment on total # studies reviewed. Researchers in Lisbon, academic setting.	Although all studies reviewed were generally consistent with DOI model, adoption of complex technology appears to be more fully addressed by a combination of models. Suggests that innovative program for support of technology adoption (EHR implementation) may be more effectively framed by a combination of technology adoption models.	III B

Table 2

Projected Work Hours for EITs and RN Super users

	Capital Hours	Operational Hours	TOTAL
Budget/RN super user			
PRE GO-LIVE			
Training - Epic (Average)	25		25
CPM (interprofessional care planning)	16		16
Art/science super users	3		3
Classroom support	12		12
Technical dress rehearsal	16		16
Dress rehearsal	16		16
PRE GO-LIVE TOTAL	**88**	0	88
POST GO-LIVE			
12 hr shifts 3/wk x Week 1-2	72		72
12 hr shifts, 2 in Week 3, 1 in Week 4 for Traditional Plan only	0	36	36
POST GO-LIVE TOTAL	**72**		108
Total/ RN super user	**160**		**196**
Backfill budget/RN super user			
Pre go-live + 8 hours to cover shift length when super users out for 8 hour class time		96	96
Post go-live		108	108
Total Backfill/RN super user		204	**204**
Budget/New Grad SU			
PRE GO-LIVE			
New Employee Orientation (NEO)		8	8
Training - Epic Average	25		25
CPM (interprofessional care planning)	16		16
Art/science super users	3		3
Customer Service Training		16	16
Classroom support	12		12
Technical dress rehearsal	16		16
Dress rehearsal	16		16
PRE GO-LIVE TOTAL	**88**	**24**	**112**
POST GO-LIVE SUPPORT			
WK 1-2:Clinical unit 24/week regular time x 2*	48		48
WK1-2:Clinical 4hr/shift **overtime** x 6shift	24		24
WK 3-4:Clinical unit 40/wk x 2*		80	80
POST GO-LIVE TOTAL	**72**	**80**	**152**
Total/new grad SU			

Note. New Grad Super users complete training one time, reducing hours required for subsequent hospitals.

Table 3

Actual Labor Expense for SU Workforce + Backfill

Actual Labor Expense for SU Workforce + Backfill				
Nursing Contract Labor Expense				
	Agency A	Agency B	Total $	
Hospital #1	$-	$604,866	$604,866	
Hospital #2	$246,880	$562,922	$809,802	
Hospital #3	$383,028	$999,760	$1,382,788	
Hospital #4	$291,900	$615,807	$907,707	
Hospital #5	$318,148	$957,615	$1,275,763	
	$1,239,956	$3,740,970	**$4,980,926**	
All Super user and Backfill Labor Expense (EIT: RN SU hours (63%:37%)				
	EIT$	RN SU $	Contract $	**Total Labor**
Hospital #1	$569,905	$547,160	$604,866	**$1,721,932**
Hospital #2	$557,237	$657,739	$809,802	**$2,024,778**
Hospital #3	$499,123	$497,732	$1,382,788	**$2,379,643**
Hospital #4	$328,227	$348,963	$907,707	**$1,584,896**
Hospital #5	$490,210	$532,656	$1,275,763	**$2,298,629**
Incentives + Manager $	$306,080	$-	-	**$306,080**
	$2,750,782	$2,584,250	$4,980,926	**$10,315,958**
Alternative Costs for RN SU model with 100% Contract Labor Backfill				
	EIT$	RN SU $	Contract $	**Total Labor**
Hospital #1	$-	$1,094,321	$1,209,733	**$2,304,054**
Hospital #2	$-	$1,315,477	$1,619,604	**$2,935,081**
Hospital #3	$-	$995,464	$2,765,575	**$3,761,040**
Hospital #4	$-	$697,925	$1,815,414	**$2,513,339**
Hospital #5	$-	$1,065,313	$2,551,526	**$3,616,839**
		$5,168,500	$9,961,852	**$15,130,352**
			Net expense avoidance	**$4,814,394**
				31.8%
Non-Super user Technical Work Performed by EITs				
	EIT HRS	EIT$	IT Contract Labor Cost	Net Expense
Hospital #1	600	$19,200	$(30,000)	$(10,800)
Hospital #2	208	$6,656	$(10,400)	$(3,744)
Hospital #3	320	$10,240	$(16,000)	$(5,760)
Hospital #4	256	$8,192	$(12,800)	$(4,608)
Hospital #5	600	$19,200	$(30,000)	$(10,800)
	$1,984	$63,488	$(99,200)	$(35,712)

Note. Additional savings of slightly more than $35,000 were produced by utilization of EITs for non-super user, Epic-related work that would otherwise have been performed by contract labor. The additional work benefited EITs eager to continue earning during periods of inactivity between assignments.

References

Bailey, J., Berg, J., Cardin, S., Jones, D., McFarland, P., & Orlowski, C. (2013). *2011-2012 New graduate nurse hiring survey* [White paper]. Retrieved from California Institute for Nursing and Health Care: http://cinhc.wpengine.netdna-cdn.com/wp-content/uploads/2013/02/2011-2012-Californa-New-Grad-Hiring-Survey2.pdf

Bhattacherjee, A. (2001, September 1). Understanding information systems continuance: and expectation-confirmation model. *MIS Quarterly*, *25*(3), 351-370.

Centers for Disease Control and Prevention. (2012). *Meaningful Use Introduction*. Retrieved from http://www.cdc.gov/ehrmeaningfuluse/introduction.html

Centers for Medicare & Medicaid Services. (2014). *2014 Definition Stage 1 of Meaningful Use*. Retrieved from http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/Meaningful_Use.html

Choi, J., & De Martinis, J. E. (2013). Nursing informatics competencies: assessment of undergraduate and graduate nursing students. *Journal of Clinical Nursing*, *22*, 1970-1976. http://dx.doi.org/10.1111/jocn.12188

Dearholt, S., & Dang, D. (2012). *Johns Hopkins nursing evidence-based practice: model and guidelines* (2nd ed.). Indianapolis, IN: Sigma Theta Tau International.

Desroches, C. A., & Rosenbaum, S. J. (2010, March 25). Meaningful use of health information technology in U.S. hospitals. *New England Journal of Medicine*, *362(12*), 1153-1155.

Duckert, J., & Rose, A. D. (2013, February). Embracing the EHR's challenges and benefits. *Journal of AHIMA*, 42-43. Retrieved from http:ahima.org/ehim/bestpractices

Fetter, M. S. (2009, February). Graduating nurses' self-evaluation of information technology competencies. *Journal of Nursing Education*, *48*(2), 86-90.

Gagnon, M., Desmartes, M., Lebecque, M., Car, J., Pagliari, C., Pluye, P., ... Legare, F. (2012, March 30). Systematic review of factors influencing the adoption of information and communication technologies by healthcare professionals. *Journal of Medical Systems*, *36*, 241-277. http://dx.doi.org/10.1007/s10916-010-9473-4

Granlien, M. S., & Hertzum, M. (2012). Confirmatory factor analysis of service quality dimensions within mobile telephony industry in Ghana. *The Electronic Journal Information Systems Evaluation*, *15*(2), 197-227. Retrieved from www.ejise.com

Granlien, M. S., & Hertzum, M. (2012b, February). Barriers to the adoption and use of an electronic medical record. *Electronic journal of information systems evaluation*, *15*(2), 216-227. Retrieved from www.ejise.com

Halbesleben, J. R., Wakefield, D. S., Ward, M. M., Brokel, J., & Crandall, D. (2009, February). The relationship between super users' attitudes and employees' experiences with clinical information systems. *Medical Care Research and Review*.

Kaya, N. (2011, February). Factors affecting nurses' attitudes toward computers in healthcare. *CIN: Computers, Informatics, Nursing*, *29*(2), 121-129.

Kutney-Lee, A., & Kelly, D. (2011, November). The effect of hospital electronic health record adoption on nurse-assessed quality of care and patient safety. *Journal of Nursing Administration*, *41*, 466-472. http://dx.doi.org/10.1097/NNA.0b013e3182346e4b

Lee, J., Yang, Y. F., & Goodwin, J. S. (2013, February 1). The effect of electronic medical record adoption on outcomes in US hospitals. *BMC Health Services Research,* 13(39), 1-7. http://dx.doi.org/10.1186/1472-6963-13-39

Mair, F. S., May, C., O'Donnell, C., Sullivan, F., & Murray, E. (2012). Factors that promote or inhibit the implementation of E-health systems: an explanatory systematic review. *Bulletin of the World Health Organization*, *90*, 357-364.

McNeil, B. J., Elfrink, B. L., Bickford, C. J., Pierce, S. T., Beyea, S. C., Averill, C., & Klappenbach, C. (2003, August). Nursing information technology, skills and preparation of student nurses, nursing faculty, and clinicians: a U.S. survey. *Nursing Information Technology*, *42*(8), 341-349.

Morrissey, J. (2012, October). The quality disconnect. *Hospitals and Health Networks*, *86*(10), 25-30. Retrieved from www.hhnmag.com

Office of Statewide Health Planning and Development. (2012). *Active registered nurses in California by county of record*. Retrieved from http://www.oshpd.ca.gov

Oliveira, T., & Martins, M. F. (2011). Literature review of information technology adoption models at firm level. *The Electronic Journal Information Systems Evaluation* , *14*(1), 110-121.

Pare, G., Sicotte, C., Poba-Nzaou, P., & Balouzakis, G. (2011). Clinicians' perceptions of organizational readiness for change in the context of clinical information system projects: insights from two cross-sectional surveys. *Implementation Science*, *6*(15), 1-14. Retrieved from http://www.implementationscience.com/content/6/1/15

Prensky, M. (2001a, October). Digital natives, digital immigrants. *On the Horizon*, *9*(5), 1-6. Retrieved from www.marcprensky.com

Prensky, M. (2001b, December). Digital natives, digital immigrants, Part II: Do they really think differently? *On the Horizon*, *9*(6). Retrieved from www.marcprensky.com

Silow-Carroll, S., Edwards, J. N., & Rodin, D. (2012). *Using electronic health records to improve quality and efficiency: the experiences of leading hospitals* (The Commonwealth Fund pub. 1608 Vol. 17). Retrieved from The Commonwealth Fund website: www.commonwealthfund.org/publications/issue-briefs/2012/jul/using-EHRs-to-improve-quality-and-efficiency.aspx

Simmons, N. (2013, February). A super user group for your electronic health record! *CIN: Computers, Informatics, Nursing*, 53-56.

Smith, E. R., & Semin, G. R. (2007). Situated social cognition. *Current Directions in Psychological Science*, *6*(3), 132-135.

Stanley, P. V. (2013). *Innovative Approach to New Nurse Residency, Meaningful Use and Health Care Reform* (Unpublished doctoral dissertation). University of San Francisco, California.

Straub, E. T. (2009, June 12). Understanding technology adoption: Theory and future directions for informal learning. *Review of Educational Research*, *79*, 625-649. http://dx.doi.org/10.3102/0034654308325896

U.S. Department of Health & Human Services. (n.d.). *HITECH Act enforcement interim final rule*. Retrieved from http://www.hhs.gov/ocr/privacy/hipaa/administrative/enforcementrule/hitechenforcementifr.html

Whittaker, A. A., Aufdenkamp, M., & Tinley, S. (2009). Barriers and facilitators to electronic documentation in a rural hospital. *Journal of Nursing Scholarship*, *41*(3), 293-300.

Appendix A

Prospective Financial Analysis of Two Super user Models

		Capital Expense		Operating Expense				
Traditional SU Plan	**# RN SU**	**Total Hrs**	**$$**	**Total Hrs**	**$$**	**Total Hrs**	**$$**	**TOTAL COST**
Hospital #1	120	19,200	$1,051,776	4,320	$236,650	24,480	$1,836,000	$3,124,426
Hospital #2	110	17,600	$1,102,288	3,960	$248,015	22,440	$1,683,000	$3,033,303
Hospital #3	120	19,200	$974,208	4,320	$219,197	24,480	$1,836,000	$3,029,405
Hospital #4	70	11,200	$666,512	2,520	$149,965	14,280	$1,071,000	$1,887,477
Hospital #5	120	19,200	$1,092,096	4,320	$245,722	24,480	$1,836,000	$3,173,818
		86,400	**$4,886,880**	**19,440**	**$1,099,548**	**110,160**	**$8,262,000**	**$14,248,428**
		Capital Expense		**Operating Expense**				
New Grad (NG) Super user Plan*	**# SU**	**Total Hrs**	**$$**	**Total Hrs**	**$$**	**Total Hrs**	**$$**	**TOTAL COST**
RN SU Hospital #1	60	9,600	$525,888			12,240	$918,000	$1,443,888
NG SU Hospital #1	60	9,600	$350,674	6,240	$212,035			$562,709
RN SU Hospital #2	55	8,800	$551,144			11,220	$841,500	$1,392,644
NG SU Hospital #2	55	8,800	$321,451	5,720	$194,366			$515,816
RN SU Hospital #3	60	9,600	$487,104			12,240	$918,000	$1,405,104
NG SU Hospital #3	60	9,600	$260,966	4,800	$163,104			$424,070
RN SU Hospital #4	35	5,600	$333,256			7,140	$535,500	$868,756
NG SU Hospital #4	35	5,600	$204,560	3,640	$123,687			$328,247
RN SU Hospital #5	60	9,600	$546,048			12,240	$918,000	$1,464,048
NG SU Hospital #5	60	9,600	$260,966	4,800	$163,104			$424,070
NG incentives	110				$233,640			$233,640
Nurse Manager	1	2,080	$162,240					$162,240
			$4,004,297		**$1,089,936**		**$4,131,000**	**$9,225,233**
						Net Cost Avoidance		**$5,023,195**

Appendix B

Johns Hopkins Nursing Evidence Based Practice Appraisal Tool

JHNEBP Research Evidence Appraisal

Evidence Level:_____

ARTICLE TITLE:					NUMBER:
AUTHOR(S):					DATE:
JOURNAL:					
SETTING:				SAMPLE (COMPOSITION/SIZE)	
☐ Experimental	☐ Meta-analysis	☐ Quasi-experimental	☐ Non-experimental	☐ Qualitative	☐ Meta-synthesis
Does this study apply to my patient population?				☐ Yes	☐ No
If the answer is No, STOP here (unless there are similar characteristics).					
Strength of Study Design					
• Was sample size adequate and appropriate?				☐ Yes	☐ No
• Were study participants randomized?				☐ Yes	☐ No
• Was there an intervention?				☐ Yes	☐ No
• Was there a control group?				☐ Yes	☐ No
• If there was more than one group, were groups equally treated, except for the intervention?				☐ Yes	☐ No
• Was there adequate description of the data collection methods				☐ Yes	☐ No
Study Results					
• Were results clearly presented?				☐ Yes	☐ No
• Was an interpretation/analysis provided?				☐ Yes	☐ No
Study Conclusions					
• Were conclusions based on clearly presented results?				☐ Yes	☐ No
• Were study limitations identified and discussed?				☐ Yes	☐ No
PERTINENT STUDY FINDINGS AND RECOMMENDATIONS					
Will the results help me in caring for my patients?				☐ Yes	☐ No

Evidence Rating (scales on back)

Strength of Evidence Rating			
Quality Rating (check one)	☐ High (A)	☐ Good (B)	☐ Low/major flaws(C)

Appendix B (continued)

STRENGTH OF EVIDENCE
LEVEL 1 (HIGHEST)

EXPERIMENTAL STUDY (RANDOMIZED CONTROLLED TRAIL OR RCT)

- Study participants (subjects) are randomly assigned to either a treatment (TX) or control (non-treatment) group.
- May be:
  - Blind: neither subject nor investigator knows which TX subject is receiving.
  - Double-blind: neither subject nor investigator knows which TX subject is receiving.
  - Non-blind: both subject and investigator know which TX subject is receiving; used when it is felt that the knowledge of treatment is unimportant.

META-ANALYSIS OF RCTS

- Quantitatively synthesizes and analyzes results of multiple primary studies addressing a similar research question
- Statistically pools results from independent but combinable studies
- Summary statistic (effect size) is expressed in terms of direction (positive, negative, or zero) and magnitude (high, medium, small)

LEVEL 2

QUASI-EXPERIMENTAL STUDY

- Always includes manipulation of an independent variable
- Lacks either random assignment or control group.
- Findings must be considered in light of threats to validity (particularly selection)

LEVEL 3

NON-EXPERIMENTAL STUDY

- No manipulation of the independent variable.
- Can be descriptive, comparative, or relational.
- Often uses secondary data.
- Findings must be considered in light of threats to validity (particularly selection, lack of severity or co-morbidity adjustment).

QUALITATIVE STUDY

- Explorative in nature, such as interviews, observations, or focus groups.
- Starting point for studies of questions for which little research currently exists.
- Sample sizes are usually small and study results are used to design stronger studies that are more objective and quantifiable.

META-SYNTHESIS

- Research technique that critically analyzes and synthesizes findings from qualitative research
- Identifies key concepts and metaphors and determines their relationships to each other
- Aim is not to produce a summary statistic, but rather to interpret and translate findings

QUALITY RATING (SCIENTIFIC EVIDENCE)

A High quality: consistent results, sufficient sample size, adequate control, and definitive conclusions; consistent recommendations based on extensive literature review that includes thoughtful reference to scientific evidence.

B Good quality: reasonably consistent results, sufficient sample size, some control, and fairly definitive conclusions; reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence

C Low quality or major flaws: little evidence with inconsistent results, insufficient sample size, conclusions cannot be drawn.

Appendix C

Approval of Project Activity as Non-Research (USF)

Approved: SONHP Leadership Council.7.8.13.

University of San Francisco
School of Nursing and Health Professions

Student Project Approval:
Statement of Determination

Title of Project: **An Innovative Approach to EHR Super User Staffing**

Brief Description of Project:

This process improvement project consists of design and implementation of a unique, supplemental workforce to serve as implementation technicians ("super-users") to support direct care nurses during the implementation of a new electronic health record platform across five hospitals. This innovative staffing model will reduce by approximately 50% the number of direct care staff normally reassigned to implementation support roles, thereby preserving core staff for care delivery and reducing dependence on contract labor to fill clinical shifts.

Recent graduates of nursing baccalaureate programs will be hired and trained as implementation technicians. After completion of a standardized super-user training program, they will assist with classroom training activities, and will provide at-the-elbow technical support for direct care RN's and allied health professionals during the first few weeks after go-live of the EHR platform. Upon completion of each hospital's implementation, technicians will rotate to the next hospital scheduled for EHR implementation. At the completion of the project, the implementation technicians will be encouraged to apply as internal candidates for RN residency positions at any of the organization's hospitals.

Expected outcomes of this project include $5 million reduction in labor expense for implementation, reduced variability in patient experience scores during EHR implementation, and future reduced RN residency costs secondary to elimination of EHR training modules from that curriculum.

Appendix C (continued)

Approved: SONHP Leadership Council.7.8.13.

To qualify as an Evidence-based Change in Practice Project, rather than a Research Project, the criteria outlined in federal guidelines will be used: (http://answers.hhs.gov/ohrp/categories/1569)

☒ This project meets the guidelines for an Evidence-based Change in Practice Project as outlined in the Project Checklist (attached). Student may proceed with implementation.

☐ This project involves research with human subjects and must be submitted for IRB approval before project activity can commence.

Comments:

Signature of Supervising Faculty Marjorie Barter 9/15/13 **(date)**

Signature of Student KBullard RN 9/11/2013 **(date)**

EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST *

STUDENT NAME: Katherine Bullard, MS, RN **DATE: 9/11/2013**

SUPERVISING FACULTY Marjorie Barter, RN, EdD, CNL, CENP

Instructions: Answer YES or NO to each of the following statements:

Project Title:	**YES**	**NO**
The aim of the project is to improve the process or delivery of care with established/ accepted standards, or to implement evidence-based change. There is no intention of using the data for research purposes.	**X**	
The specific aim is to improve performance on a specific service or program and **is a part of usual care**. ALL participants will receive standard of care.	**X**	
The project is **NOT** designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective comparison groups, cross-sectional, case control). The project does **NOT** follow a protocol that overrides clinical decision-making.	**X**	
The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does **NOT** develop paradigms or untested methods or new untested standards.	**X**	

Appendix C (continued)

Approved: SONHP Leadership Council.7.8.13.

The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does **NOT** seek to test an intervention that is beyond current science and experience.	**X**	
The project is conducted by staff where the project will take place and involves staff who are working at an agency that has an agreement with USF SONHP.	**X**	
The project has **NO** funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.	**X**	
The agency or clinical practice unit agrees that this is a project that will be implemented to improve the process or delivery of care, i.e., **not** a personal research project that is dependent upon the voluntary participation of colleagues, students and/ or patients.	**X**	
If there is an intent to, or possibility of publishing your work, you and supervising faculty and the agency oversight committee are comfortable with the following statement in your methods section: *"This project was undertaken as an Evidence-based change of practice project at X hospital or agency and as such was not formally supervised by the Institutional Review Board."*	**X**	

ANSWER KEY: If the answer to **ALL** of these items is yes, the project can be considered an Evidence-based activity that does NOT meet the definition of research. **IRB review is not required. Keep a copy of this checklist in your files.** If the answer to ANY of these questions is **NO**, you must submit for IRB approval.

*Adapted with permission of Elizabeth L. Hohmann, MD, Director and Chair, Partners Human Research Committee, Partners Health System, Boston, MA.

THIS TABLE PROVIDES AN OVERVIEW OF THE DIFFERENCE BETWEEN RESEARCH AND QUALITY OR PROCESS IMPROVEMENT

	RESEARCH	QI/PROCESS IMPROVEMENT
DEFINITION	"A systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge. Activities, which meet this definition, constitute research for purposes of this policy, whether or not they are conducted or supported under a program, which is considered research for other purposes. For example, some demonstration and service programs may include research activities."	Assess or improve a process, program or system to improve performance as judged by the evidence, i.e., established/ accepted standards

Appendix C (continued)

Approved: SONHP Leadership Council.7.8.13.

	http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.html#46.102	
PURPOSE	Answer a question or test a hypothesis	Improve performance/ process or systems
BENEFITS	May or may not benefit current patients, but may benefit future patients	Directly benefits a process, program or system and may or may not directly benefit patients
RISKS	May put subjects at risk	Does not increase risk to patients with exception of possible privacy/ confidentiality concerns
DATA COLLECTION	Systematic data collection	Systematic data collection
DATA ANALYSIS	Statistically prove or disprove hypothesis	Compare a program/ process/ system to an established set of standards

Appendix D

IRB Approval for Non-Research Project (PHSCA)

PROVIDENCE HOLY CROSS MEDICAL CENTER
INSTITUTIONAL REVIEW BOARD
Phone: (818) 496-4021 Fax: (818) 496-4462
Federalwide Assurance: 00018453 (expires January 8, 2018)
IRB Number: 00003586

May 8, 2014

Katherine L. Bullard, R.N.
Regional Chief Nursing Officer
Regional Operations
501 S. Buena Vista St.,
Burbank, CA 91505

Re: "An Innovative Approach to EHR (Electronic Health Records) Super User Staffing"

Dear Ms. Bullard:

The proposed activity as described in your IRB application **does not** constitute human subjects research. IRB review is not required.

Should any change occur to the procedures, please contact the IRB staff at (818) 496-4021.

In addition, your application listed the anticipated beginning date of the project is "November 2013". Please note that the IRB cannot approve projects submitted after the fact; so it is important that prior review is necessary to determine whether you need IRB approval before the research commences and/or before research subjects are recruited in the project. Retroactive or post-hoc IRB approval is prohibited by the federal regulations.

Sincerely,

Shamel Sanani, M.D.
Vice Chairman, PHCMC Institutional Review Board
/mc

Appendix D (continued)

PROVIDENCE LITTLE COMPANY OF MARY MEDICAL CENTER (Torrance/San Pedro)
INSTITUTIONAL REVIEW BOARD
Phone: (818) 496-4021 Fax: (818) 496-4462
Federalwide Assurance: 00006916 expires on February 07, 2017
IRB Number: 00004082

April 21, 2014

Katherine L. Bullard, R.N.
Regional Chief Nursing Officer
Regional Operations
501 S. Buena Vista St.,
Burbank, CA 91505

Re: "An Innovative Approach to EHR (Electronic Health Records) Super User Staffing"

Dear Ms. Bullard:

The proposed activity as described in your IRB application **does not** constitute human subjects research. IRB review is not required.

Should any change occur to the procedures, please contact the IRB staff at (818) 496-4021.

In addition, your application listed the anticipated beginning date of the project is "November 2013". Please note that the IRB cannot approve projects submitted after the fact; so it is important that prior review is necessary to determine whether you need IRB approval before the research commences and/or before research subjects are recruited in the project. Retroactive or post-hoc IRB approval is prohibited by the federal regulations.

Sincerely,

James H. French MD

James French, M.D.
Chairman, PLCM Institutional Review Board
/mc

Appendix D (continued)

PROVIDENCE TARZANA MEDICAL CENTER
INSTITUTIONAL REVIEW BOARD
Phone: (818) 496-4021 Fax: (818) 496-4462
Federalwide Assurance Number: 000007814 expires February 11, 2018
IRB Number: 00004468

April 24, 2014

Katherine L. Bullard, R.N.
Regional Chief Nursing Officer
Regional Operations PSJ
501 S. Buena Vista St.,
Burbank, CA 91505

Re: "An Innovative Approach to EHR (Electronic Health Records) Super User Staffing"

Dear Ms. Bullard:

The proposed activity as described in your IRB application **does not** constitute human subjects research. IRB review is not required.

Should any change occur to the procedures, please contact the IRB staff at (818) 496-4021.

In addition, your application listed the anticipated beginning date of the project is "November 2013". Please note that the IRB cannot approve projects submitted after the fact; so it is important that prior review is necessary to determine whether you need IRB approval before the research commences and/or before research subjects are recruited in the project. Retroactive or post-hoc IRB approval is prohibited by the federal regulations.

Sincerely,

Samuel Fink, M.D.
Chairman, PTMC Institutional Review Committee
/mc

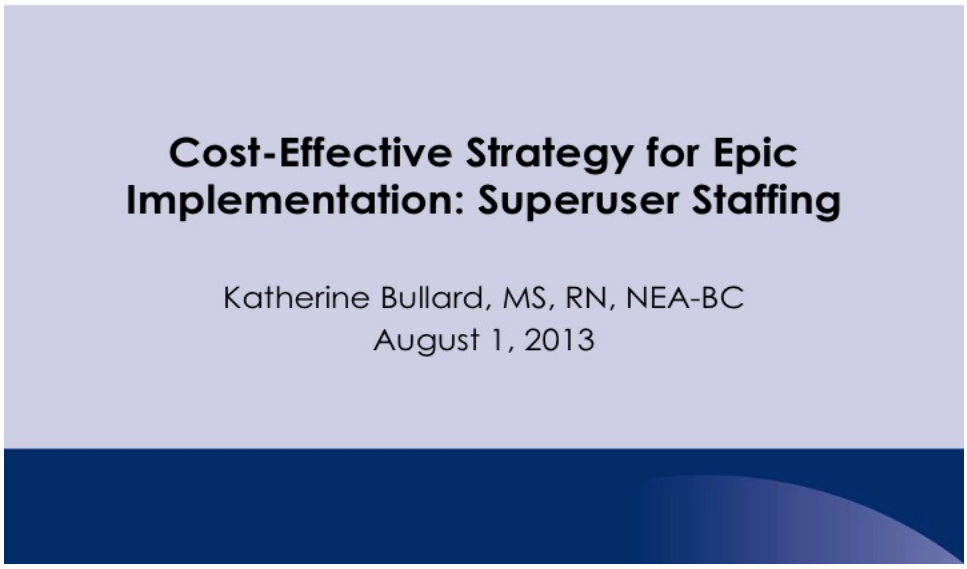
Appendix E

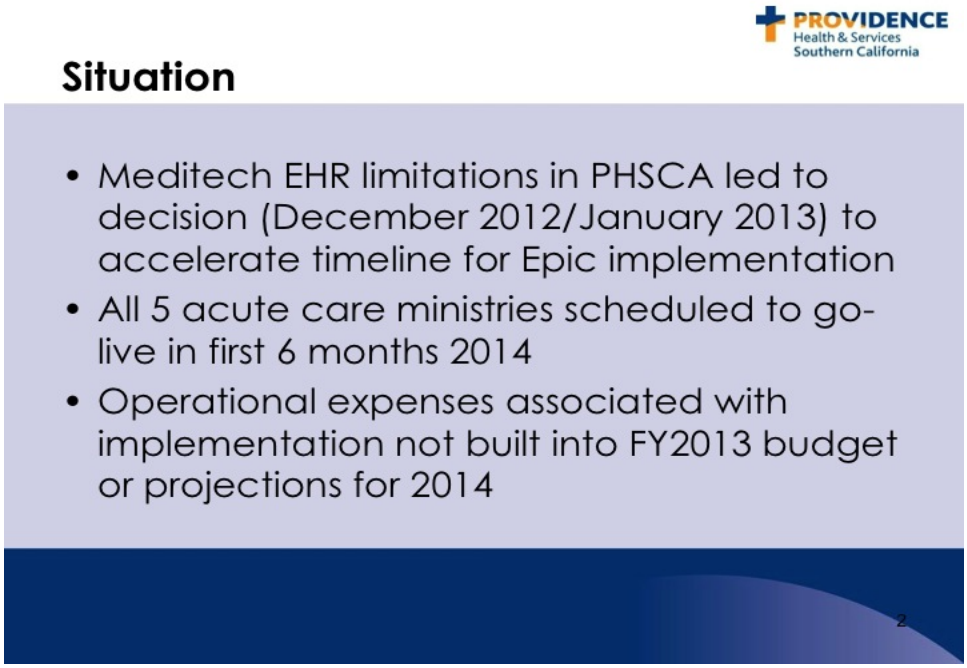
Strengths, Weaknesses, Opportunities, Threats (SWOT) Analysis

Strengths	**Weaknesses**
Culture encourages innovation. Preferred vendor staffing agency contract due for renewal, can be leveraged. Supply Chain leader for PHS available to negotiate agency contract. Project Manager with nursing background is available. Staffing leader of adjacent PHS region is available as consultant.	Current RN vacancy rate 5-8% results in excess premium labor expense. Distance and collective bargaining agreements prevent sharing of staff. Recruiting effectiveness is limited. Staffing software and processes vary between hospitals. Epic implementation model relies on "just in time" schedules, limiting access to firm staffing projections.
Opportunities	**Threats**
Surplus of unemployed recently graduated RNs are available in local market. Long-term strategy includes establishing regional nursing resource pool. Hiring temporary staff as super users in Information Systems department precludes need for union negotiation. Existing model for physician liaisons has been successful, sets stage for other non-clinician super users. Contract labor pool from adjacent region has 300-350 RN's experienced with PHS Epic.	Depletion of core staff diverted to trainer and super user roles may limit capacity. Short advance notice may limit number of agency staff available for backfill. Hospital CNO's and Directors may not support use of recently graduated RNs. Contract labor rates for EHR backfill staffing are higher than standard rates. Winter census surges could exceed staffing capacity during training.

Appendix F

Presentation to Executive Team for Approval of Project





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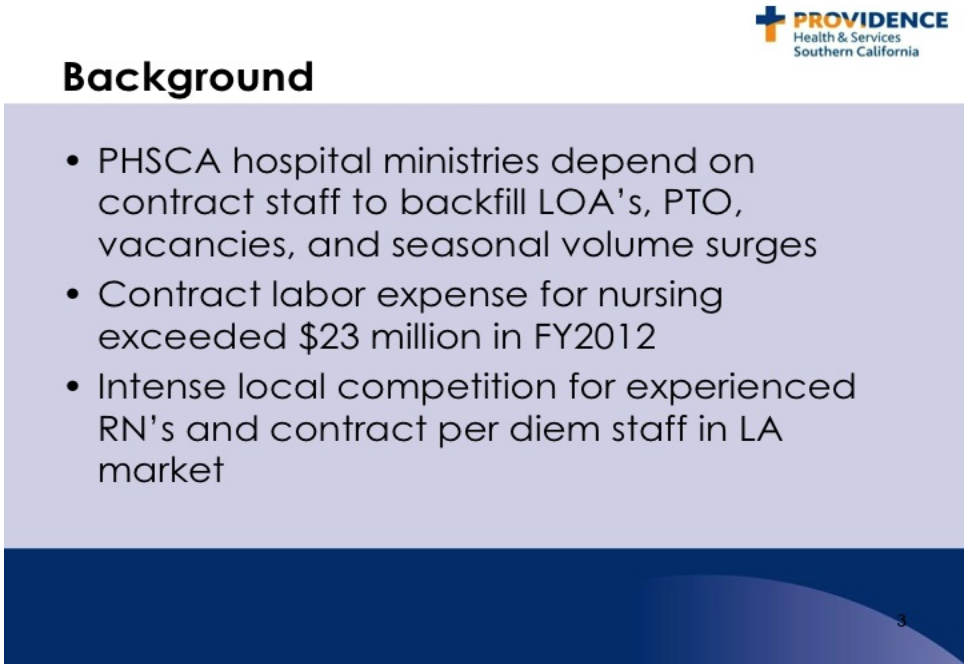

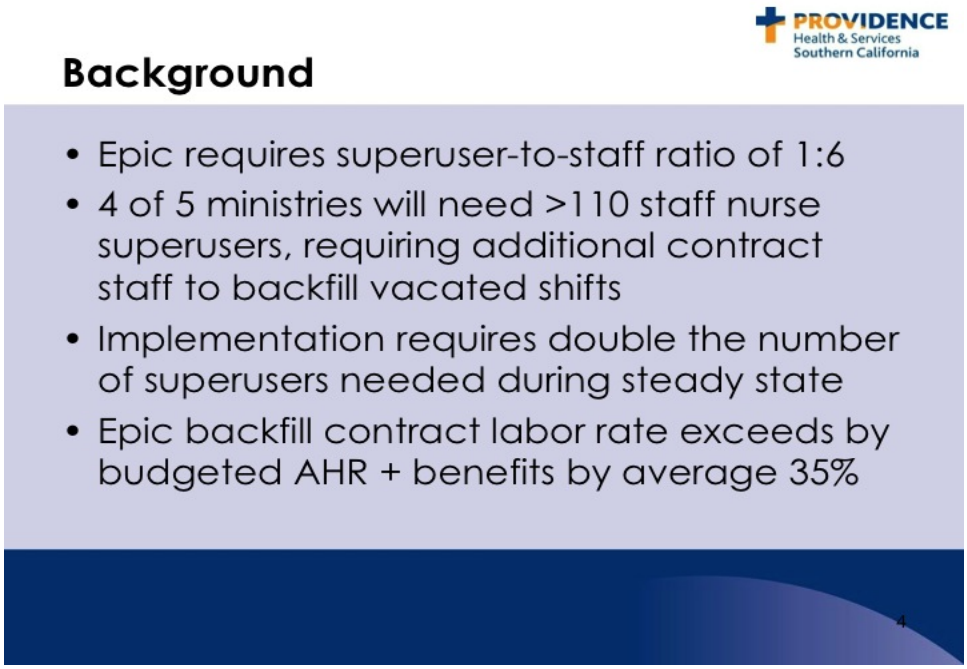

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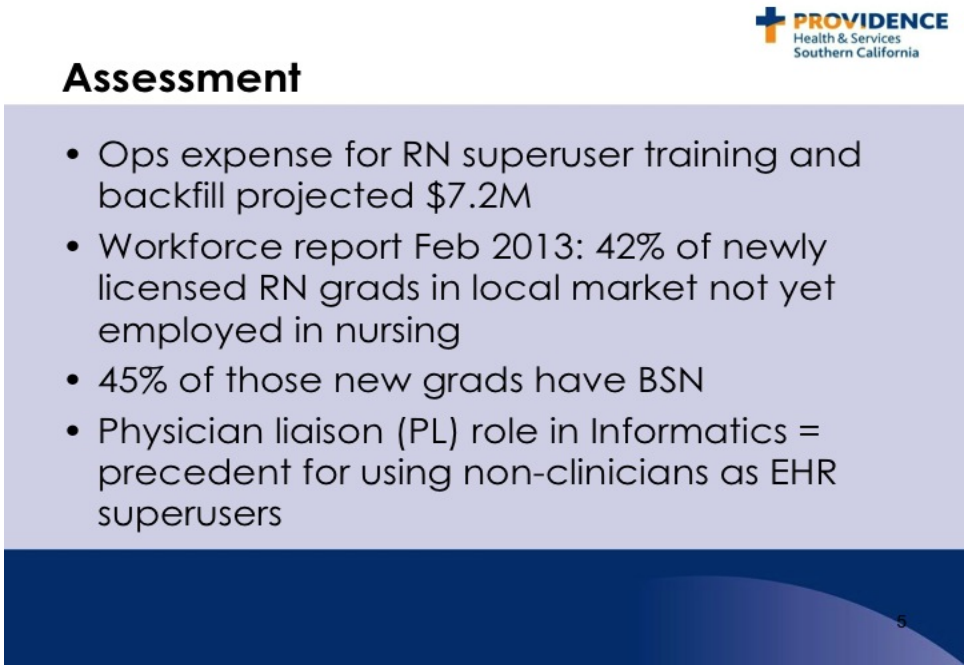

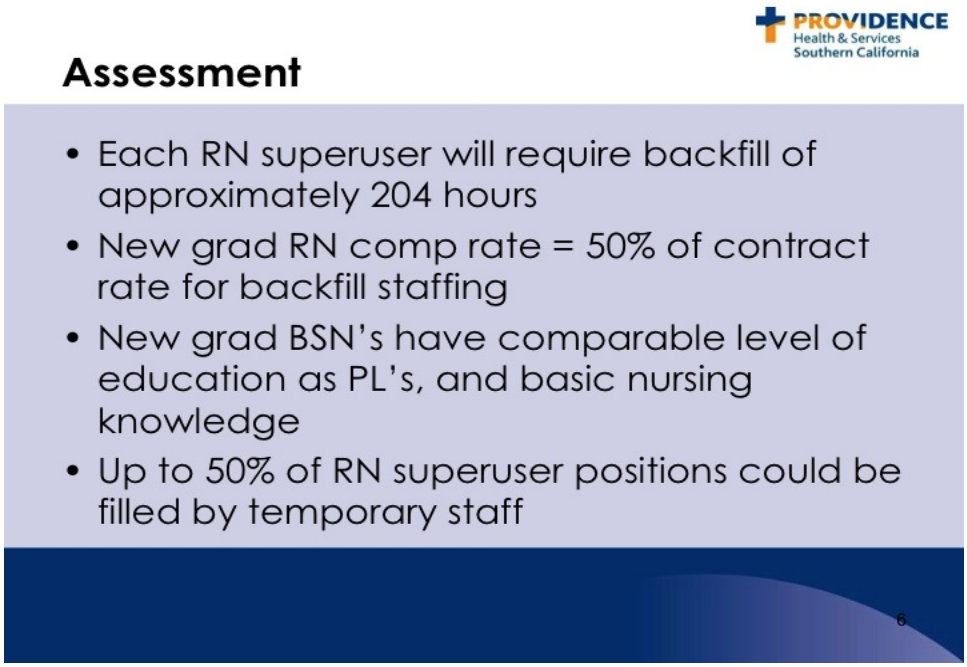

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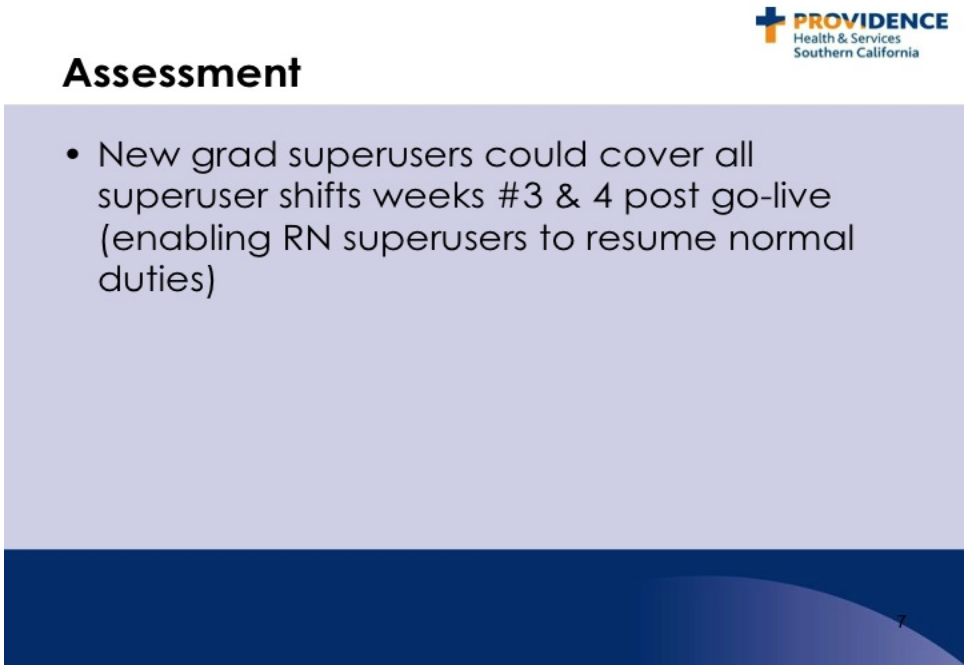

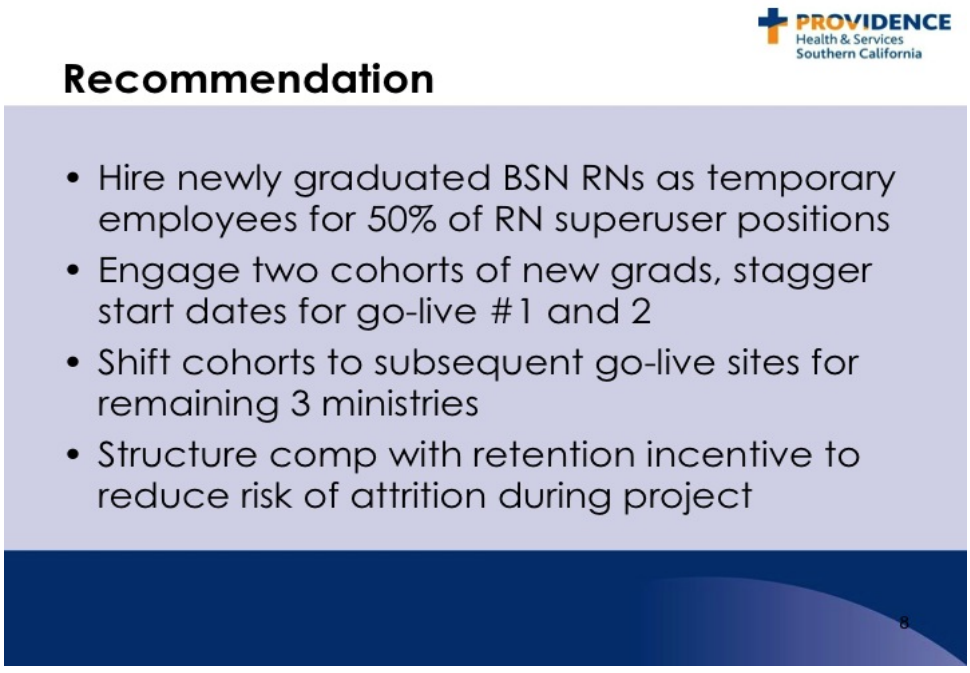

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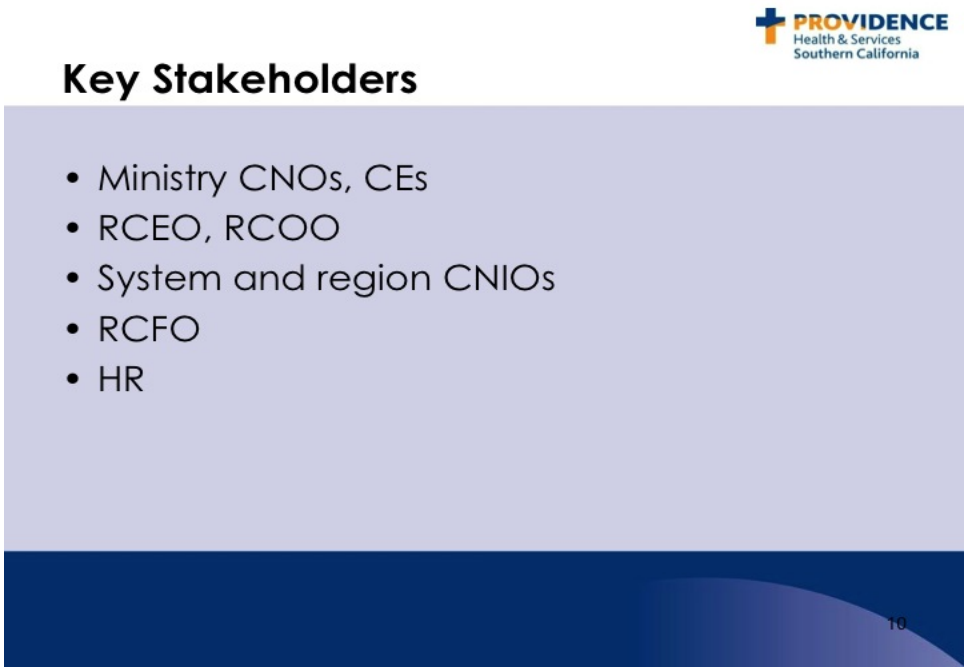

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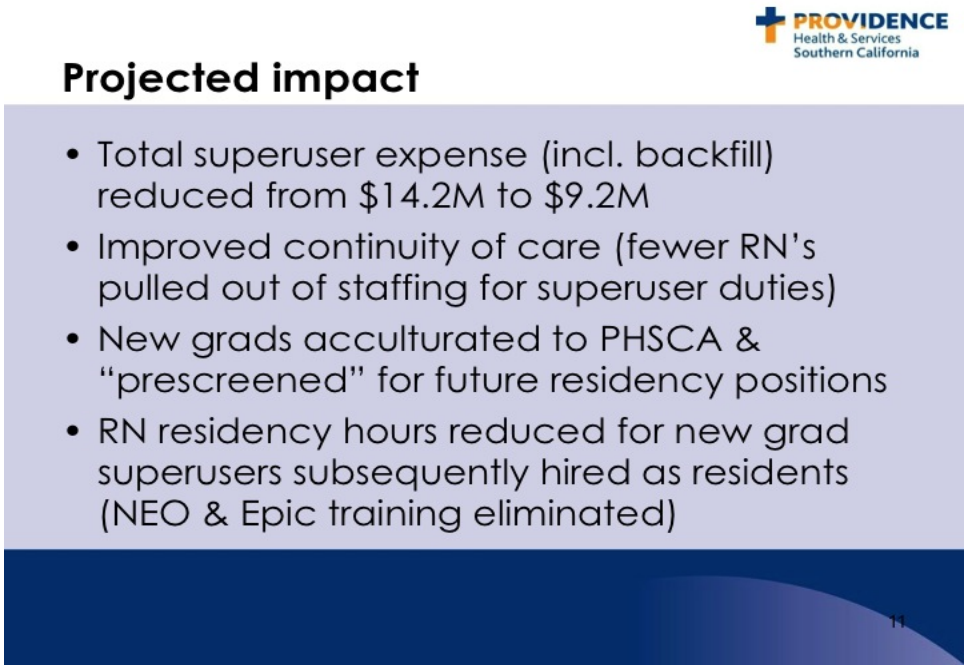


Appendix G

Project Team Membership

Role	Individual	Description
Executive Sponsor	RCNO	Responsible for the project within PHSCA. Exerts influence to overcome resistance to the project.
Project Lead	Designated Staffing Office Manager	Senior leader for the change the project will deliver. A key "owner" of the results expected from the project, has (or has been granted) authority and political clout to make the project successful. An active participant in the project, helping the team to stay on course and removing barriers to success.
Project Manager	PM	Ensures the project is on time, within budget and meets the deliverables and quality agreed upon in the project plan. Directly supports the Project Sponsor(s) with their accountabilities and responsibilities.
Organizational Leaders: **Chief Nursing Officers**	CNO #1-5	Organizational Leaders are department directors or managers who are key stakeholders in the project whose clinical or business unit will directly or indirectly be affected by the project.
Process Owner(s): **Supply Chain** **Human Resources** **Information Services**	Manager Director CIO	The owner of the functional business or clinical area impacted by the project takes responsibility for the business/clinical decisions and the subsequent results.
Team Member(s)	Epic Liaison & Staffing Manager each hospital	The Team Members are project team members that are subject matter experts, champions for the change, and authorized to make the change.
IT Manager(s)	CNIO, Epic Deployment Director	IT Management ensures the required technologies and resources are available for the project.
Steering Committee	RCNO, CNO #1-5, CNIO, PM, Project Lead	The Steering Committee is a chartered committee (local, regional or Enterprise wide) that has oversight of this particular project.

Appendix H

Project Timeline

Project Activity	2013								2014								
	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
Determine #EITs needed																	
Financial analysis/ROI																	
Executive approval																	
Job descriptions approved																	
Recruit cohort A 60 EITs																	
Recruit EIT Manager																	
Draft training schedules																	
(A) EITs orient, train																	
Recruit cohort B 55 EITs																	
A EITs work Hospital #1																	
B EITs orient, train																	
B EITs work Hospital #2																	
Recruit cohort C 35 EITs																	
C EITs orient, train																	
A EITs work Hospital #3																	
C EITs work Hospital #4																	
B EITs work Hospital #5																	
Recruit RN residents																	
Collect outcome data																	
Final financial analysis																	

Appendix I

Job Description for Epic Implementation Technicians (EITs)

JOB DESCRIPTION
Providence Strategic and Management Services

This document is intended to describe the general content of, and requirements for, the performance of this job.
It is not to be construed as an exhaustive statement of duties, responsibilities, or requirements.

POSITION TITLE: Epic Super User

REPORTS TO*:* Regional Nursing Informatics Leader

SUPERVISES: N/A

POSITION SUMMARY

The Epic Super User position serves as an additional resource for the implementation of the Epic system. The super user supports all clinical staff roles throughout the care continuum (as assigned.) A Super User is expected to be a knowledgeable project advocate, who will generate enthusiasm and excitement for Epic, as well as overall organizational change. This individual will be a liaison between end users, specialty and site leaders, informatics and Providence Health and Services Epic implementation team. This resource will provide operational support for the project pre-, during, and post go-live by leading, reinforcing, and validating standard workflows and best practices, acting as the local change agent, and assisting with training, implementation activities, and at-the-elbow end user support.

All duties must be performed in a manner that promotes team success, and reflects the Providence Health & Services mission, philosophy, and core values of respect, compassion, justice, excellence and stewardship.

KEY WORKING RELATIONSHIPS

- The Super User is a ministry and regional resource reporting to the clinical Informatics supervisor role in their assigned area.
- The Super User works collaboratively with interdisciplinary teams at the Heath System, Regional and ministry level, including but not limited to: physicians/providers; hospitalists; residents; nursing leadership and staff; pharmacists; respiratory therapists, rehab services, nutrition services, spiritual care services, Regional and System Information Services teams supporting clinical systems; system, Regional, ministry, and departmental physician, nursing and clinical informaticists and educators.

Appendix I (continued)

KEY POSITION ACCOUNTABILITIES

- Attend all Epic training and demonstrate required proficiency.
- Attend all super user training and demonstrate required proficiency.
- Support credential trainers during end user training classes.
- Attend change management / ownership training.
- Identify and communicate potential issues, risks, and resistance to change.
- Attend and participate in a pre-go live logistics / process preparation meeting.
- Attend and participate in super user status meetings.

During and immediately after go-live, super users:

Provide support to end users through pre, during, and post go live by offering front line support and answering questions about Epic applications.

- Provide the end-user community with a familiar face—someone who is familiar with your organization's operations and the system.
- Approach users who are struggling, and assist them in completing tasks.
- Attend daily post live status / issue meetings
- Provide feedback on users' knowledge and essential skills

ESSENTIAL POSITION COMPETENCIES AND REQUIREMENTS

Education & Experience:

Bachelor's degree in nursing is the required level of education.

License/Registration/Certifications

Active license or certification to practice as a registered nurse is required.

Working Conditions

- Frequent travel among regional facilities is required
- Occasional travel among Providence regions is required
- A valid driver's license, car insurance, and a reliable vehicle for transportation throughout the region is required
- Employee will be required to work variable and rotating shifts (may require early morning and evening hours), to work on-call, after hours and weekends.

Knowledge, Skills, and Abilities

- For licensed nurses, physicians and other clinicians, knowledge of professional standards as reflected in appropriate practice act of the state where licensed.

Appendix I (continued)

- Demonstrated ability to be self directed, collaborative, to escalate appropriately, to communicate clearly, and to learn quickly, with strong attention to detail.
- Ability to identify system constraints or gaps in routine business requirements and effectively communicate issues / risks to the team in a timely manner.
- Knowledge and understanding of adult learning styles.
- Excellent verbal and written communications skills, both interpersonally and on a technical level.
- Demonstrated ability to quickly learn new technology and applications.
- Good critical thinking skills used toward analyzing, testing, troubleshooting, and isolating complex problems.
- Intermediate experience with Microsoft Office applications including Outlook, Word, Excel, PowerPoint as well as SharePoint preferred.
- Basic technical troubleshooting skills.
- Ability to be self-motivated to complete assigned duties as well as be proactive in seeking out new opportunities
- Ability to perform duties in a participative and collaborative manner.
- Ability to acquire knowledge to function at a proficient level using Epic Enterprise Suite EHR applications desired - over time will need to learn additional applications.

Appendix J

Job Description for Nurse Manager of EITs

Providence Health System- S. California Region

NURSE MANAGER – EPIC IMPLEMENTATION

Position Summary
Under direction this position coordinates the provision of direct end-user support during implementation of an electronic health record, facilitating clinicians (nurses, members of the credentialed medical staff, and all care providers) in their clinical practice and clinical decision-making, coordinating resources to provide both hardware and software computer support to end-users. The position is accountable for working with the PHS-CA nursing leaders, caregivers and Clinical Informatics team to provide robust Electronic Health Record (EHR) implementation support to the PHS CA nursing team. The position reports to the Regional Chief Nursing Informatics Officer (CNIO), and works closely with the Regional Chief Medical Information Officer (CMIO), the Regional and Ministry Chief Nursing Officers (CNOs) for multiple Providence Southern California (PHS-CA) ministries to implement an electronic health record that supports safe quality practice, administrative and management information needs, and system support for improved patient outcomes.

Position Accountabilities
The following are essential job accountabilities:

1. Demonstrates Providence Health System core values of respect, justice, compassion, stewardship, and excellence to customers, employees, and visitors; and provides quality service in the performance of work assignments and duties. (5)
2. Considers factors related to safety, effectiveness, cost, and impact on practice in the planning and delivery of Electronic Health Record (EHR) implementation support. Utilizes staffing management principles to assure adequate EHR implementation support for nursing staff. Assists in the development, implementation and modification of programs and services needed to meet nursing staff needs. (1,3)
2. Prepares budget, as applicable, and adheres to budgetary standards. (3)
3. Demonstrates clinical expertise in the execution of the Nursing process and directs staff in its application. (3,5)
4. Selects, trains/orients, assigns department staff, evaluates performance, and makes recommendations for personnel actions. (1,3)
5. Uses leadership principles to anticipate and influence change. (3,5)
7. Determines resources and actions needed to accomplish objectives. (1,3)
8. Sets priorities and manages time effectively. (3,5)

Appendix J (continued)

9. Identifies potential problems/opportunities and plans contingent action collaborating with the hospital management team, clinical informatics team, EHR analysts and informal leaders in these efforts. Keeps CNIO, CMIO, and CNO apprised of clinical issues, triage problems, staffing issues, and risk management concerns. (1,3)
10. Ensures that nursing standards and practices are developed and met. (2,3)
11. Demonstrates proactive leadership skills of delegation, organization, and coordination in running assigned unit; delegates these responsibilities as appropriate. (3).
12. Portrays and promotes effective communication with staff, physicians, patients/families/significant others, and other departments. (3)
13. Promotes a safe environment that supports ministry caregivers with the delivery of high quality patient care. (3,5,6)
14. Identifies needs, plans independently and in conjunction with others for the clinical and leadership development of staff. (3)
15. Plans for appropriate and safe staffing levels. (3,5)
16. Protects patient confidentiality by promoting professional staff communications. (3,5)
6. Attends administrative meetings and actively participates on taskforces and committees. (5)
7. Maintains departmental reports and records and collects statistical data for administrative and regulatory purposes.
8. Performs other duties as assigned or requested.

1 The performance of this function is the reason that the job exists.

2 There are limited employees among whom the performance of this function can be distributed.

3 This occupies a great deal of the employee's time.

4 This function is highly specialized. Employees are hired for the skill/ability to perform this.

5 Failure to perform this function may have serious consequences.

6 Exposure to blood-borne pathogens that requires use of personal protective equipment.

Job Specifications

Minimum Experience

3 years of recent management experience involving complex scheduling of more than 100 employees and direct supervision of employees across multiple geographic locations.

Required Certification/Registration

CPR - Adult, Child, Infant (Provider), including Obstructed Airway Management, sponsored by the American Heart Association or the American Red Cross

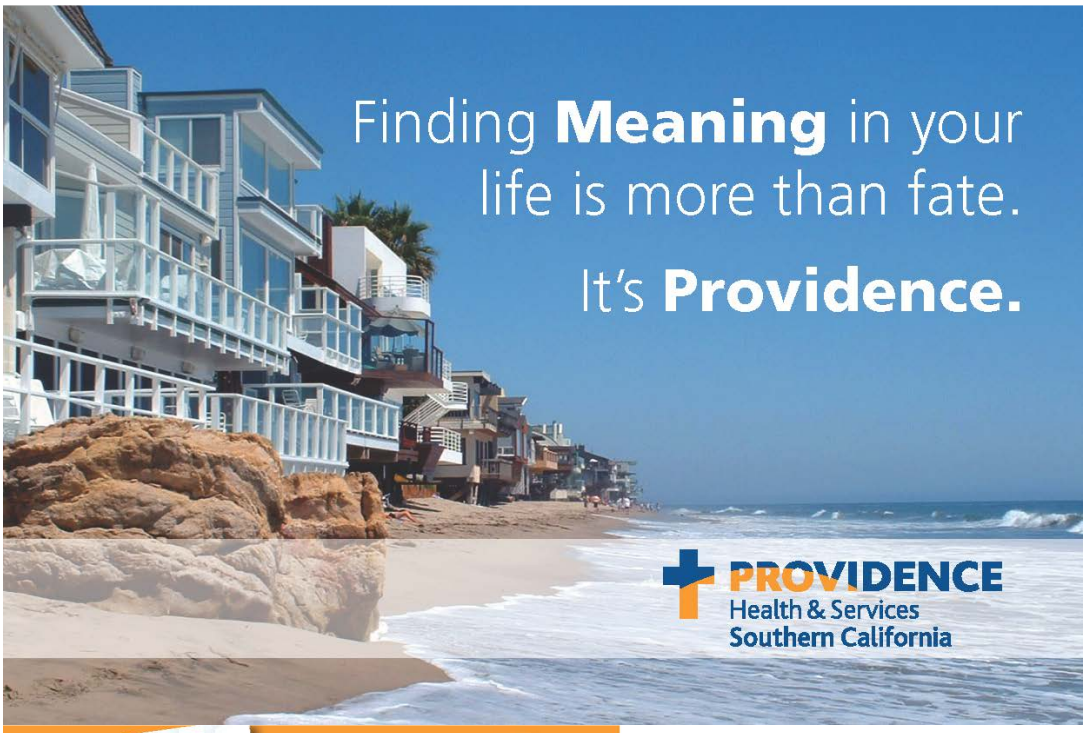
Required Education and Licenses

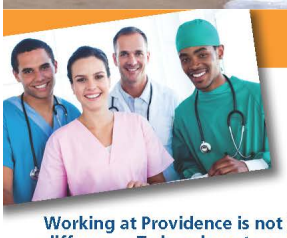
Master of Science in Nursing, or Bachelor of Science in Nursing and Master of Business Administration or Health Care Administration.

California Licensed Registered Nurse

Appendix K

Direct Mail Postcard





JOB FAIR
Experienced RNs

Working at Providence is not just a career. It's a chance to make a difference. To be a hero to someone in need.

Anchored by five award-winning comprehensive medical centers, Providence Health & Services, Southern California, provides a full spectrum of care that includes not only leading-edge diagnostics and treatment, but outpatient health centers, the well-regarded Providence Medical Institute physician group, numerous outreach programs and clinics serving those in need, hospice and home care and even our own Providence High School, a Blue Ribbon college-preparatory campus.

Providence Health & Services, Southern California is looking for
- Experienced RNs
- New Grads with BSN to work in non-bedside role
- RN Case Managers, Educators, Nurse Specialists

Saturday, August 24th, 9:30am to 3pm ** Adults only, please*
The Olympic Collection Banquet Hall and Conference Center
11301 Olympic Blvd. #204, Los Angeles, CA 90064

Providence Saint Joseph Medical Center in Burbank
Providence Holy Cross Medical Center in Mission Hills
Providence Tarzana Medical Center in Tarzana
Providence Little Company of Mary Medical Center in San Pedro
Providence Little Company of Mary Medical Center in Torrance

Enter for a chance to win a free tablet!
**Multiple winners chosen. Must attend to be eligible.*

For registration, please go to
www.providenceiscalling.jobs
and apply to requisition #----- for experienced RNs
or #----- for New Grads with BSN

Pre-register Now!

Providence Health & Services is an Equal Opportunity Employer.

PROVIDENCE
Health & Services
Southern California
501 South Buena Vista St.
Burbank, CA 91505

Appendix L

PROVIDENCE Health & Services

Interview Tool
Clinical System Liaison/Physician Liaison
Questions/Comments/Evaluation

Candidate Name _____
Date: _____

Interviewer Name _____

Panel Participants:

Assigned Panel Participant	Topic		
	Rating Key: 5=Much more than Acceptable 4=More than Acceptable 3=Acceptable 2=Less than Acceptable 1=Much less than Acceptable **Rating**		**Notes**
	Motivational Fit		
	Tell us how you see this position fitting in with your career goals. • Why are you interested in this position?	What impressed me? Concerns?	5 4 3 2 1
	Functional Skills		
	Please describe a specific time that you taught an adult learner in either an informal or formal setting. What techniques did you use?	What impressed me? Concerns?	5 4 3 2 1
	Priority Setting		
	We often have multiple obligations and conflicting priorities.	What impressed me?	5 4 3 2 1

	• Describe a time when you had to juggle multiple competing priorities and multiple competing stakeholders. How did you prioritize and address these needs?	Concerns?	
	Relationship Management / Interpersonal Savvy / Peer Relationships		
	When joining a team, what would your initial steps be to build credibility with that team and its leaders?	What impressed me? Concerns?	5 4 3 2 1

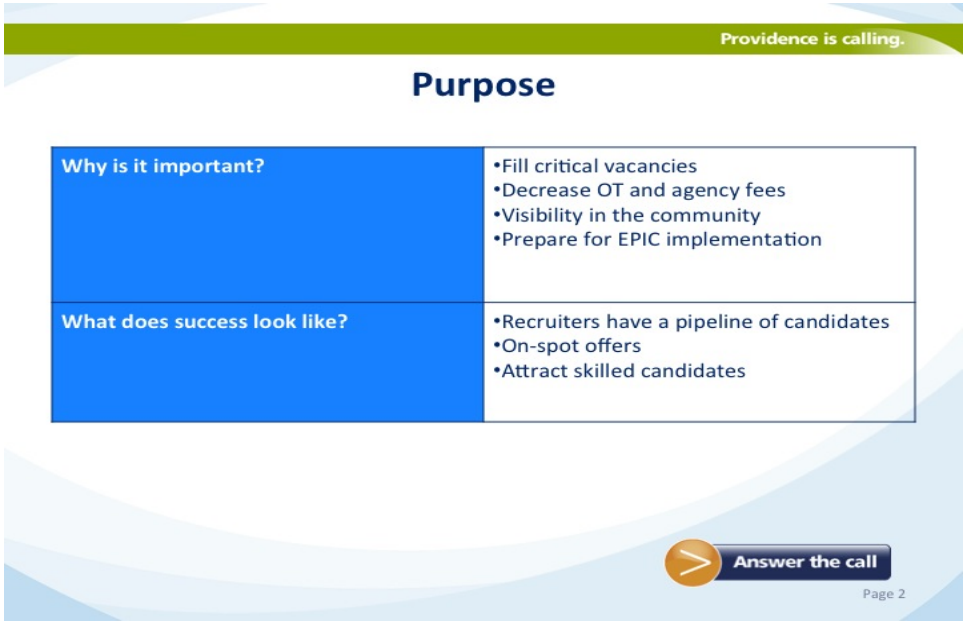
	Conflict Management		
	Tell us about a specific incident when you dealt with a difficult professional, and explain how it was handled.	What impressed me? Concerns?	5 4 3 2 1
	Critical Thinking		
	(Hypothetical situation) A supervisor/manager/director comes to you to share a concern – she has noticed a number of reports that share a common theme and she asks you to "educate the staff" to fix the problem. • How do you respond?	What impressed me? Concerns?	5 4 3 2 1

	Communication / Positive Attitude	
	This is not asked of the applicant, rather it is assessed at the end of the interview. • Able to communicate thoughts, ideas, and concepts in a clear, concise, and easily understood manner • Views the world in a positive and optimistic manner, and not always assuming that there are hidden agendas behind every act. • Is open to change and new ideas. ***5 = Much more than acceptable:*** *Excellent communication, clear and easy to understand. Has excellent communication skills and comes across as smooth and polished in his/her communication. Came across as positive and impactful.* ***4 = More than acceptable*** ***3 = Acceptable****: Able to articulate and communicate thoughts in an understandable manner. Clear and straightforward without being overly wordy or overly short. Responded to questions with a reasonable level of enthusiasm and energy. Appeared generally attentive, interested and involved. Came across as generally positive and upbeat.* ***2 = Less than acceptable*** ***1 = Much less than acceptable:*** *Very difficult to understand. Either overly wordy or overly short in responses. Would have difficulty communicating effectively over the phone. Came across as very flat, unemotional or even somewhat down. Could be described as somewhat aloof and only moderately attentive*	5 4 3 2 1
Additional Notes		

Please return this completed tool to Interview Facilitator by _____/_____/_____.

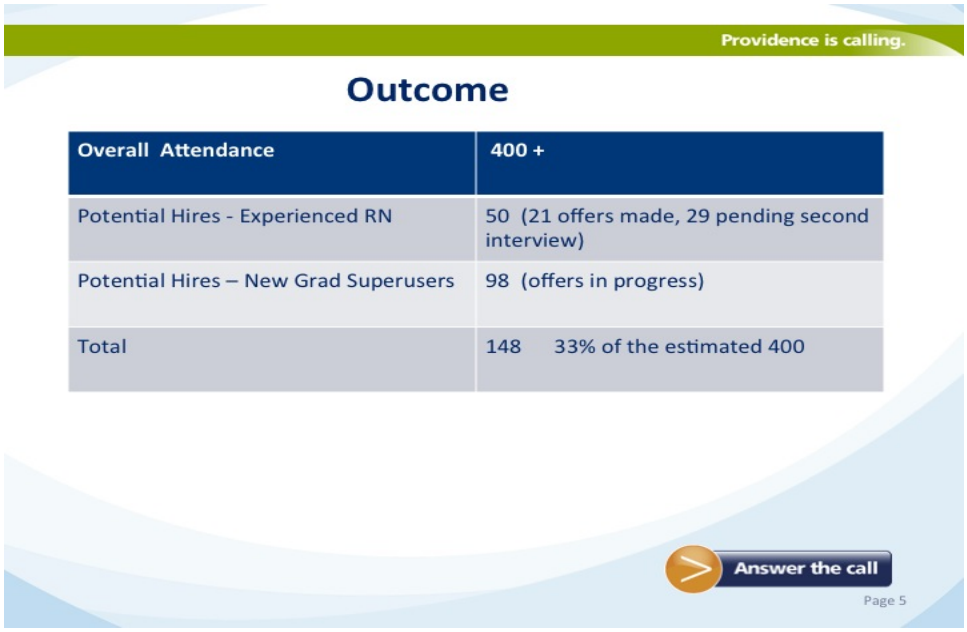
Appendix M

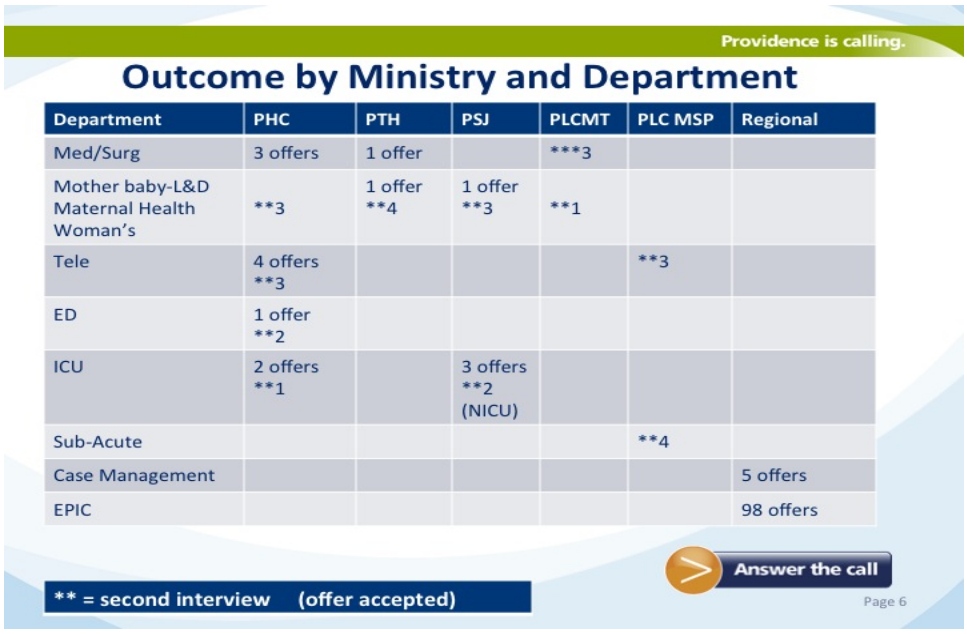
Job Fair Outcomes



Appendix M (continued)

Appendix M (continued)





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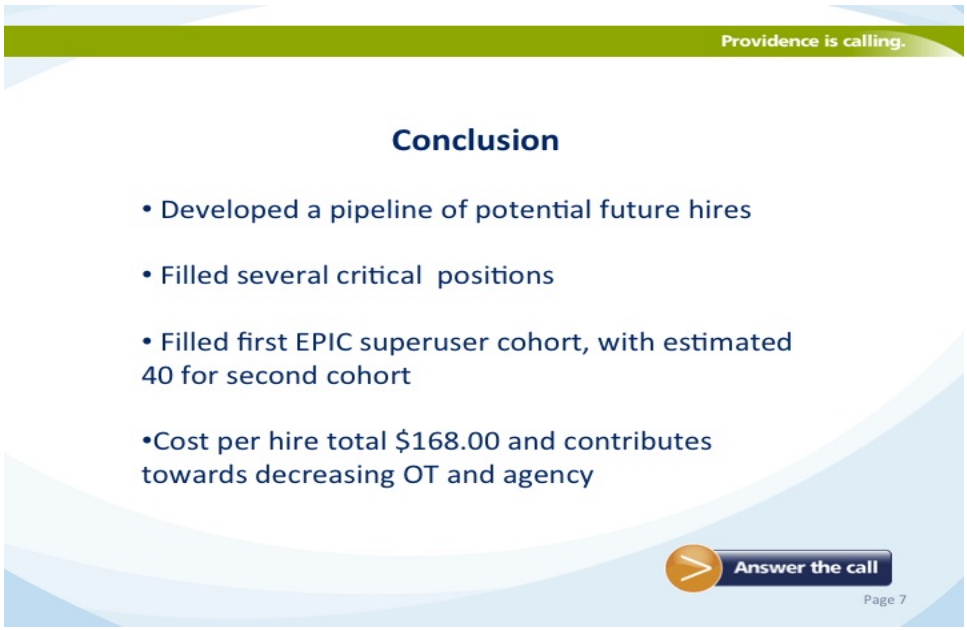

Appendix N

EITs and RN Super users during Cutover Preparations

Appendix O

Press Release

PROVIDENCE
Health & Services
Southern California

News Release

For Immediate Release

Contact: Patricia Aidem
Phone: 818.496.4780

Recently Graduated Nurses Share Tech Skills with Veteran Nurses at Providence Medical Centers

Group of Newcomers Comprise First Class of Nurse Residents

LOS ANGELES (June 4, 2014) – Providence Health & Services has created a novel nurse residency program to provide on-the-job experience for recently graduated registered nurses – after the novices helped veteran nurses master a new state-of-the-art electronic health records system.

The first session began this week and was open to 50 "new grads" who were hired by Providence in November to serve as technicians, coaching their more experience counterparts nurses in utilizing the latest technology. All 50 have been guaranteed positions at five of the six Providence medical centers in the Los Angeles area upon completion of their residency training.

The new nurses are among 180 young men and women who recently received bachelor's degrees from nursing schools throughout Southern California and are the first "wave" of technicians hired to help implement Providence's new Epic health records system.

"It's difficult for new grads to find jobs in hospitals, but through this unique program they assisted our nurses with their technological skills and learned about bedside care in return," said Kathleen Alfe, nurse manager in charge of the Epic implementation. "They worked side-by-side with our nurses teaching them the system, and learning so much at the same time."

The technicians, affectionately called "tan pants" or "Gap kids" because of the white shirts and tan slacks they wear, "grew up with iPads in their hands" and bring a solid understanding of computer systems to nurses and others who now utilize the Epic system, Alfe said.

The program is the brainchild of Katherine Bullard, R.N., regional chief nursing officer, Providence Southern California, who created it as her doctoral project. She is earning her Doctor of

Nursing Practice, Executive Leadership degree through the University of San Francisco. Her goal was to develop an innovative, cost effective program that would strengthen patient care.

By hiring the new graduates to provide technical support, nurses weren't pulled away from their jobs to help train their colleagues on Epic. The system has been going live during the last several months at Providence Holy Cross Medical Center in Mission Hills, Providence Tarzana Medical Center and Providence Little Company of Mary Medical Centers in San Pedro and Torrance. Providence Saint Joseph Medical Center in Burbank, now implementing the system, hosted a ceremony this week to mark the group's transition from technicians to resident nurses.

###

About Providence Health & Services:
Providence Health & Services, Southern California, is a Catholic not-for-profit, mission-driven healthcare system. Providence Southern California operates six award-winning hospitals and a comprehensive, fully-integrated network of primary care clinics, urgent care centers, home care, TrinityCare and TrinityKids Care hospice as well as Providence High School. Providence is anchored locally by Providence Holy Cross Medical Center in Mission Hills, Providence Saint Joseph Medical Center in Burbank, Providence Saint John's Health Center in Santa Monica, Providence Tarzana Medical Center and Providence Little Company of Mary Medical Centers in Torrance and San Pedro. With more than 3,400 physicians, Providence provides coordinated primary and specialty care through an array of physician groups and individual providers including Providence Medical Institute and physician groups in the South Bay, the West Valley and Santa Clarita. Providence affiliate, Facey Medical Group, provides primary and specialized care in the San Fernando, Santa Clarita and San Gabriel valleys. For more information, visit California.providence.org.

Appendix P

Article Published by *Catholic Health World* (September 15, 2014)

Tech-savvy new nurses swap expertise with patient-care veterans

A hospital is a high-pressure workplace. Throw in a major new computer program, with its multiple screens and mysterious sequences, and the result can try the most composed veteran nurse.

Enter the Epic Implementation Technicians, or EITs, technology-savvy nursing graduates who can show experienced health professionals when to right click or switch screens while on the job. Providence Health & Services California Region has put the two groups side by side at five of its hospitals to implement a new Epic brand electronic medical records program.

Cesar Alas, a new nurse at Providence Holy Cross Medical Center in Mission Hills, Calif., explains procedures in the hospital's new electronic medical records program to Terri Halverson, an assistant nurse manager in the hospital's emergency room.

Most of the EITs are in their 20s, recent graduates of nursing schools and all are thoroughly comfortable with mobile technology. Providence assigned them to work alongside veteran nurses throughout the hospitals when it began using the new

system, which eliminates the last of paper records at its hospitals.

Stress buster

Terri Halverson, an assistant nurse manager in the emergency room at Providence Holy Cross Medical Center in Mission Hills, Calif., said the presence of EITs was a calming influence because they were available on the spot to help solve the questions and confusions that routinely dog users of a new computer program.

"I learn these things in a class, but it's much easier to have a person who can walk through the steps right there in the clinical setting," said Halverson, a nurse for 36 years. "It certainly can defuse the stress."

Cesar Alas was one of the EITs who worked in Halverson's ER. At 44, he was the oldest of his fellow EITs, who became known to the veteran nurses as the "tan pants" because of the khaki slacks they wore for identification. Born in El Salvador, Alas didn't have a smartphone in elementary school, as did many of the younger EITs. He learned to use computers while taking college classes to study nursing. Before then he had been a bagger at a supermarket.

Appendix P (continued)

Alas said he believed his age and life story gave him an edge of credibility in helping the veteran nurses. "Several told me they thought I understood their situation because I hadn't grown up with a laptop, either," he said.

Training the trainer
Halverson said she was impressed by Alas' enthusiasm, courtesy and honesty. "If he didn't know an answer, he'd tell me that. And then he'd go get the information needed," she said.

Alas said veteran nurses asked such things as when to make a right click on a mouse, how to keep a screen open while moving to another, and how to verify that they had properly entered information. "We took on the role of a nurse, helping them through frustration and showing that everything is okay," he said.

In return, Alas got to see up close how nurses do their jobs. He quickly grew to respect their knowledge of health care and their smooth competence in action.

"I got to see how well they know their jobs, how they can keep their cool and composure and present a sense of confidence that puts patients at ease" Alas said. "It made me realize that developing that confidence is an important part of the job."

Landing the job
Alas now works at Providence Holy Cross Medical Center's telemetry/oncology department in Mission Hills. Katherine Bullard, regional chief nursing officer for Providence Southern California and creator of the EIT project, said it provides a double benefit for the hospitals — the EITs can assist in the on-floor implementation of a new computer program, and nursing supervisors get to see the novice nurses in action.

"We get to see how they perform on a job and learn about their attitudes for the work," Bullard said.


Bullard

Providence hired 180 recent graduates last November to work as EITs. Alas was among the first 50 to be assigned to hospitals in January. Bullard said Providence offered jobs to all of them.

Bullard said she developed the EIT system while working on a doctorate in nursing practice at the University of San Francisco. She said a few other hospitals in California had tried similar methods, but Providence "has the distinct advantage of being able to apply these talents in more than one hospital."

'Super users'
The future EITs spent two months in training on the Epic system.

Appendix P (continued)

Bullard said the hospital also sent some of its veteran nurses to the lengthy training program, but was able to limit the number who were away from work because of the EITs. The veterans trained on Epic became known as "super users." When it was almost time to roll out Epic, Providence provided 12 hours of training to the rest of its nursing staff, then sent the EITs onto the floors with the super users to coach and problem solve.

"The assistance has proved highly valuable," Bullard said. "Some veterans know what to do with a new system; others are anxious and uncomfortable. It's always a huge change, and it's usually not an intuitive experience to work with a new data system."

Bullard said she was heartened to see new graduates and experienced nurses offer value to each other, bridging the generational divide.

"Experienced nurses aren't always patient with new graduates," she said. "It was validating to see the young nurses offer their expertise and the veterans look upon them with appreciation."

Appendix Q

Article Published by *Angelus*

Angelus
The Tidings Online

Providence Medical Centers debut nurse residency program

August 8, 2014

Providence Health & Services has created a novel nurse residency program this summer to provide on-the-job experience for recently graduated registered nurses — after the novices helped veteran nurses master a new state-of-the-art electronic health records system.

The first session began in early June and was open to 50 "new grads" who were hired by Providence in November to serve as technicians, coaching their more experienced counterpart nurses in utilizing the latest technology. All 50 have been guaranteed positions at five of the six Providence medical centers in the Los Angeles area upon completion of their residency training.

The new nurses are among 180 young men and women who recently received bachelor's degrees from nursing schools throughout Southern California and are the first "wave" of technicians hired to help implement Providence's new Epic health records system.

"It's difficult for new grads to find jobs in hospitals, but through this unique program they assisted our nurses with their technological skills and learned about bedside care in return," said Kathleen Alfe, nurse manager in charge of the Epic implementation. "They worked side-by-side with our nurses teaching them the system and learning so much at the same time."

Appendix R

New Nurses Learn—and Teach

With 3,800 nurses in her charge, chief nursing officer Katherine Ballard has a knack for bringing out the best in everyone.

Appendix R (continued)

profiles in health

> "Computers are ubiquitous to this age group. They don't remember a home without a computer. They are at ease with technology."